Prepared By:

J-U-B ENGINEERS, INC.

Syracuse City

Storm Drain Master Plan Update

2020 Update

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SYRACUSE CITY
STORM DRAIN MASTER PLAN 2019
IMPACT FEE FACILITIES PLAN (IFFP) CERTIFICATION

In accordance with 11-36a-306., Certification of impact fee analysis,

"I certify that the attached impact fee facilities plan:

1. includes only the costs of public facilities that are:

a. allowed under the Impact Fees Act; and

b. actually incurred; or

c. projected to be incurred or encumbered within six years after the day on which each impact fee is paid;

2. does not include:

a. costs of operation and maintenance of public facilities;

b. costs for qualifying public facilities that will raise the level of service for the facilities, through impact fees, above the level of service that is supported by existing residents; or

c. an expense for overhead, unless the expense is calculated pursuant to a methodology that is consistent with generally accepted cost accounting practices and the methodological standards set forth by the federal Office of Management and Budget for federal grant reimbursement; and

3. complies in each and every relevant respect with the Impact Fees Act."

With the following conditions:

1. All of the recommendations for implementations of the IFFP made in the IFFP documents or in the Impact Fee Analysis documents are followed by City Staff and elected officials.

2. If all or a portion of the IFFP or Impact Fee Analysis are modified or amended, this certification is no longer valid.

3. All information provided to J-U-B is assumed to be correct, complete, and accurate. This includes information provided by the City as well as outside sources.

4. Clinton City has agreed that the work performed in preparation of the Impact Fee Facilities Plan meets the industry Standard of Care for such plans.

Signed:

_____ _____

Nathan Smith, P.E., Date
J-U-B Engineers, Inc.

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Figures

No table of figures entries found.

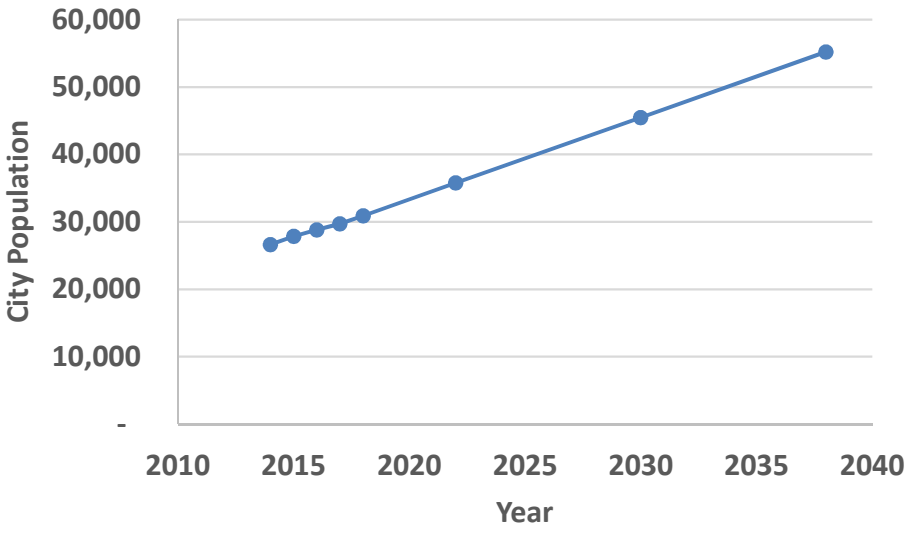
1.0 Introduction

The last update to the Syracuse City Storm Water Master Plan was in 2007. Syracuse City has commissioned that this Storm Water Master Plan update or Impact Fee Facilities Plan (IFFP) and subsequent Impact Fee Assessment (IFA) be done. J-U-B is doing the Master Plan or IFFP. Syracuse City has commissioned Zions Bank to complete the IFA. Several components are needed for the IFFA, namely: IFFA certification, included at the beginning of this report; certain determination as discussed in the Impact Fee Facilities Plan section, and Cost Estimates. These documents form the basis for Impact Fees that can be used for future development projects.

1.1 Growth and Projections

The 2014 population in Syracuse City, according to the U.S. Census Bureau, was 26,639 (U.S. Census Bureau, 2014). The growth rate from 2010 to 2014 was 9.3 percent (U.S. Census Bureau), which was a 2.3 percent annual rate of change. The growth rate from 2000 to 2010 was 149.73 percent, which was nearly a 15 percent annual rate of change. The future growth rate is anticipated to range from 4.7 percent in the early years to 2.1 percent as the City approaches build-out (Syracuse, 2014). The residential population versus year is shown in Figure 1.1.

Figure 1.1 - Syracuse City Population



2.0 Storm Water Master Plan Update

The capital facilities plan list was updated as part of the storm water masterplan and is intended to comply with the latest IFFP requirements of the State Impact fee laws, as stated in the Certification. There are several areas that need to be covered in this study for this purpose. These include Service Area Boundary; Demand Definition; Level of Service; Computation of Excess Capacity; and Future Capital Facilities.

Detention Pond – 1475 W 2150 S

2.1 Existing System Evaluation

The Service Area for this study and subsequent impact fee calculation is that of the current City limits. Land use for the service area was obtained from the current City zoning map. The land use is broken into seven categories as shown in table 2.1. Soil data was downloaded from the USDA website and was used to define soil types throughout the service area. The SCS curve number data is a function of soil type and landuse. SCS curve numbers were taken from "Hydrologic Analysis and Design", 3rd Edition, McCuen, etal, 2005. The SCS curve numbers used in the model are shown in table 2.1.

Table 2.1 Curve Number and Soil Types

Curve Numbers							
Soil Type	**School**	**Industrial**	**Commercial**	**A-1**	**P.O.**	**R-1**	**R-2, 3**
B	85	88	92	67	88	72	75
C	90	91	94	76	91	81	83
D	92	93	95	80	93	86	87

Table 2.2 Storm Drain System Inventory

Size	Total
4"	307
8"	1510
10"	965
12"	2236
15"	151306
16"	234
18"	64081
21"	7682
24"	6504
27"	783
30"	4680
33"	142
36"	6084
42"	1890
45"	4667
48"	4708
54"	673
Total Length	**258,452**
Manholes	893
Comination Box	330
Grate	1,781
Detention	44

2.2 Existing Inventory

An inventory of the Storm Drain system is given in Table 2.2. This is given as information only for the size of the system. This table shows 258,452 feet of pipe or 48.9 miles within the City. The value of the system is based upon the City's financial documents for costs, which are a part of the Impact Fee Analysis.

2.3 Calculation of Excess Capacity

The existing scenario was used to calculate the excess capacity in the existing storm drain system. The model was used to calculate the maximum flow for each pipe using Manning's equation. The model compared this flow to the actual peak flow through the pipe and output a reserve capacity value. These values are reported in Appendix C. Some of the pipes in this report show the existing peak flowrate to be "0 cfs". This typically means that flows generated from the model are entering the modeled pipe system downstream of the reporting pipe. The model is not setup to determine the inflow at each storm drain inlet.

2.4 "At Capacity" Condition/Future System Evaluation

The condition at which the development is complete and all land is improved with either buildings, asphalt or landscaping is considered the "At Capacity" condition. This also means the greatest flow possible from those developments would be received in the pipes and basins. No attempt has been made in this study to determine a particular year for this condition, as the rates would slow when land becomes more scarce, pushing back the date of any estimate.

3.0 Computer Model Information

InfoSWMM software was used to evaluate the storm drain system. This software is produced by Innovyze and is the standard in the industry for storm water modeling. An asset of this software is its ability to interface with ESRI GIS software for quick and easy transition from a Global Information Database to a network model.

3.1 Hydrologic Information

Hydrology is the study of the movement and flow of water through its natural circulation from rainfall to runoff. Rainfall is recorded over time with rain gages. Computer models are used to simulate rainfall events. The City has historically required the evaluation of the 1-inch of rainfall over a time step of 1 hour distributed according to the Farmer-Fletcher Distribution. A copy of the Farmer-Fletcher information is included in Appendix C, Table C-1.

In the Impact Fee Law, there is a differentiation between "project" and "system improvements". "Projects" are paid for and installed by the developer as part of the subdivision development. System improvements are needed to accommodate future development to the cities storm drain infrastructure. For this report, "project" improvements are required to detain their flows and discharge to only 0.2 cfs/acre to the Syracuse City storm drain system. In accordance to an agreement with Davis County, areas north of 700 South may only release at a rate of 0.15 cfs/acre of development. These project improvements are not considered part of the impact fee, but the responsibility of the developer/owner.

3.2 Level of Service

Syracuse City has defined the level of service for the storm drain system as the ability to convey the 1 inch in 1-hour design storm within the storm drain piping, detention ponds, and roadways.

3.3 Hydraulic Information

Pipe information, over land slopes, soil types and land use information are interwoven to define the hydraulic network. Hydrology information is then applied to the hydraulic network and the system is evaluated.

The system is broken down into sub basins that use GIS information to determine the way that rain water will flow off of the site. This information is unique to each sub basin.

In Appendix A, Figure 1 shows the existing pipe system used in the InfoSWMM computer model. Figure 2 shows the existing modeled system.

4.0 Capital Facilities Projects

Appendix B includes the cost estimates for future projects that have been identified through modeling. Figure 3 and Figure 4 show the locations of the projects. Table 4.0 shows the summary of the costs. A 30% contingency has been added to the project to account for items such as inflation rates and other unknowns that occur at this level of design. There is also a 10% amount added to each cost estimate for Engineering.

Table 4.0 Project Costs

Project Number	Project Location	New Development	Development Base Cost	Existing Contribution	10-Yr Growth Contribution	Growth Beyond 10 Year	IFFP Cost
SD-01	1700 S Bluff RD	$ 2,287,000	$ -	0%	100%	0%	$ 2,287,000
SD-02	3000 W 1325 S	$ 125,000	$ -	30%	70%	0%	$ 87,500
SD-03	650 S 3500 W	$ -	$ 447,000	0%	100%	0%	$ -
SD-04	600 S 3175 W	$ -	$ 750,000	0%	100%	0%	$ -
SD-05	435 S 3000 W	$ 32,620	$ 606,566	0%	100%	0%	$ 32,620
SD-06	3000 S 2400 W	$ 6,120,000	$ -	30%	70%	0%	$ 4,284,000
SD-07	700 S 2750 W	$ 782,000	$ -	10%	90%	0%	$ 703,800
SD-08	3000 W 3500 S	$ 1,548,000	$ -	30%	70%	0%	$ 1,083,600
SD-09	2500 S 2675 W	$ 162,808	$ 1,052,571	0%	0%	100%	$ -
SD-10	2700 S 3000 W	$ 2,011,000	$ -	30%	70%	0%	$ 1,407,700
SD-11	2500 W 435 S	$ 26,384	$ 874,169	0%	100%	0%	$ 26,384
SD-12	Bluff Rd 1550 W	$ 589,000	$ -	50%	50%	0%	$ 294,500
SD-13	2000 W 3200 S	$ 673,000	$ -	90%	10%	0%	$ 67,300
SD-14	1900 W 3300 S	$ 245,979	$ 784,968	0%	100%	0%	$ 245,979
SD-15	2700 S 3720 W	$ 1,012,000	$ -	40%	25%	35%	$ 253,000
SD-16	2700 S 3230 W	$ 362,346	$ 1,462,895	0%	0%	100%	$ -
SD-17	700 S 3600 W	-	-	-	-	-	-
SD-18A	1700 S 4000 W	$ 1,145,000	$ -	70%	30%	0%	$ 343,500
SD-18B	1700 S 4300 W	$ 1,305,583	$ -	70%	0%	30%	$ -
SD-19	2200 S 3720 W	$ 1,110,498	$ 1,882,853	30%	70%	0%	$ 777,348.44
SD-20	3700 S 1425 W	$ 1,393,000	$ -	0%	0%	100%	$ -
SD-21	700 W Bluff Rd.	$ 219,785	$ 963,370	0%	0%	100%	$ -
SD-22	3000 W 1000 S	$ 74,378	$ 856,329	0%	0%	100%	$ -
	TOTAL	**$ 21,225,379**	**$ 9,680,721**				**$ 11,894,232**

Notes: "New Development" indicates system improvements that are included in the impact fee calculation. "Developer Base Cost" indicates projects improvements that may need oversizing for future development outside of the existing development. Some assumptions have been made on minimum pipe sizing; however, the developer must take care of their development in spite of these assumptions. "Existing Deficiency" indicates System Improvements that are currently deficient, independent of any new growth.

Table 4.0 breaks the costs into three categories: Existing Deficiencies, New Development; and Developer Base Cost. The Existing Deficiencies are projects that are problems today regardless of any additional growth. These should be paid by the existing residents through means other

than impact fees. New Development projects are those that would not be required if not for growth. The Developer Base Cost is the cost for the minimum size of pipe and improvement needed for a development. Since a minimum pipe size is 15" per city standards, this would include the 15" pipe in a new development and the equivalent percentage of a project with larger pipes that exceed the need of the development. Table 4.0 also shows the flow contribution percentages for each time period shown. The IFFP cost is included to reflect the contribution percentage on the New Development cost and will be used in the IFA.

4.1 10-Year Projections

A review of the priority of the projects was completed to determine the project needs within the next 0-5 years, 5-10 years, and beyond 10 years. This analysis is included in table 4.1.

Table 4.1 Project Schedule

Project Number	Project Location	0-5 Years (2019-2024)		5-10 Years (2025-2030)		Beyond 10 Years	
		New Development	Development Base Cost	New Development	Development Base Cost	New Development	Development Base Cost
SD-01	1700 S Bluff RD	$ 2,287,000	$ -				
SD-02	3000 W 1325 S	$ 125,000	$ -				
SD-03	650 S 3500 W	$ -	$ 447,000				
SD-04	600 S 3175 W	$ -	$ 750,000				
SD-05	435 S 3000 W	$ 32,620	$ 606,566				
SD-06	3000 S 2400 W	$ 6,120,000	$ -				
SD-07	700 S 2750 W	$ 782,000	$ -				
SD-08	3000 W 3500 S	$ 1,548,000	$ -				
SD-09	2500 S 2675 W					$ 162,808	$ 1,052,571
SD-10	2700 S 3000 W			$ 2,011,000	$ -		
SD-11	2500 W 435 S			$ 26,384	$ 874,169		
SD-12	Bluff Rd 1550 W			$ 589,000	$ -		
SD-13	2000 W 3200 S			$ 673,000	$ -		
SD-14	1900 W 3300 S			$ 245,979	$ 784,968		
SD-15	2700 S 3720 W			$ 1,012,000	$ -		
SD-16	2700 S 3230 W					$ 362,346	$ 1,462,895
SD-17	700 S 3600 W						
SD-18A	1700 S 4000 W			$ 1,144,067	$ -		
SD-18B	1700 S 4300 W					$ 1,145,000	$ -
SD-19	2200 S 3720 W	$ 1,110,498	$ 1,882,853				
SD-20	3700 S 1425 W					$ 1,393,000	$ -
SD-21	700 W Bluff Rd.					$ 219,785	$ 963,370
SD-22	3000 W 1000 S					$ 74,378	$ 856,329
	TOTAL	**$ 12,005,118**	**$ 3,686,419**	**$ 5,701,430**	**$ 1,659,137**	**$ 3,357,316**	**$ 4,335,165**

4.2 Project Cost Estimates

Efforts have been made to obtain as much information about the future project and yet keep the estimates simple and understandable. Assumptions have been made on slopes, depth and utility corridor availability. Additional assumptions are shown in project cost estimates located in Appendix B.

5.0 Conclusions and Recommendations

It is recommended that the City do the following:

1. This study and the Associated IFA must be adopted by the City along with specified public hearings in accordance with the Law prior to adoption.
2. As stated in the IFFP certification, it is imperative that the City know and understand the information in both this IFFP and the IFA accompanying this study.
3. The City needs to continue to collect storm water utility fees in order to adequately operate, maintain, and manage the existing storm water system.
4. Along with Existing Deficiencies, it is recommended that the City evaluate other depreciation issues in an effort to keep the infrastructure current. This would include, but not be limited to deteriorating concrete pipes, rusted corrugated metal pipes, and old pipes that have exceeded the expected useful life.
5. Continue to collect survey grade elevation data for manhole locations, rim and invert elevations, and pipe size in and out of the manholes. This data needs to be updated in the cities GIS database and the InfoSwmm Model.
6. This study should be reevaluated in no more than 10 years to keep within the 10 year planning window for capital improvements allowed by the impact fee law.
7. Figure 5 is included in Appendix A to show the peak flows that have been calculated in the system. These values do not represent the absolute maximum flowrate that may occur through the piping system.

Appendix A – Figures

Appendix B - Cost Estimates

Appendix C - Data

Syracuse

Existing
Storm Drain System

Figure 1

0 1,000 2,000 Feet

Syracuse City Limits
Storage
Outfall

Open Channel	16"	36"
4"	18"	40"
8"	21"	42"
10"	24"	45"
12"	27"	48"
15"	30"	54"

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OTHER J-U-B COMPANIES

N

Syracuse

Modeled Existing Storm Drain System

Figure 2

0 1,000 2,000 Feet

Syracuse City Limits
Storage
Outfall

Open Channel	16"	36"
4"	18"	40"
8"	21"	42"
10"	24"	45"
12"	27"	48"
15"	30"	54"

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Future Projects
Storm Drain System

Figure 3

0 1,000 2,000 Feet

- Storage
- Outfall
- Subcatchments
- Existing Pipes
- 10 Year Project Pipes
- Future Build Out Pipes

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Syracuse

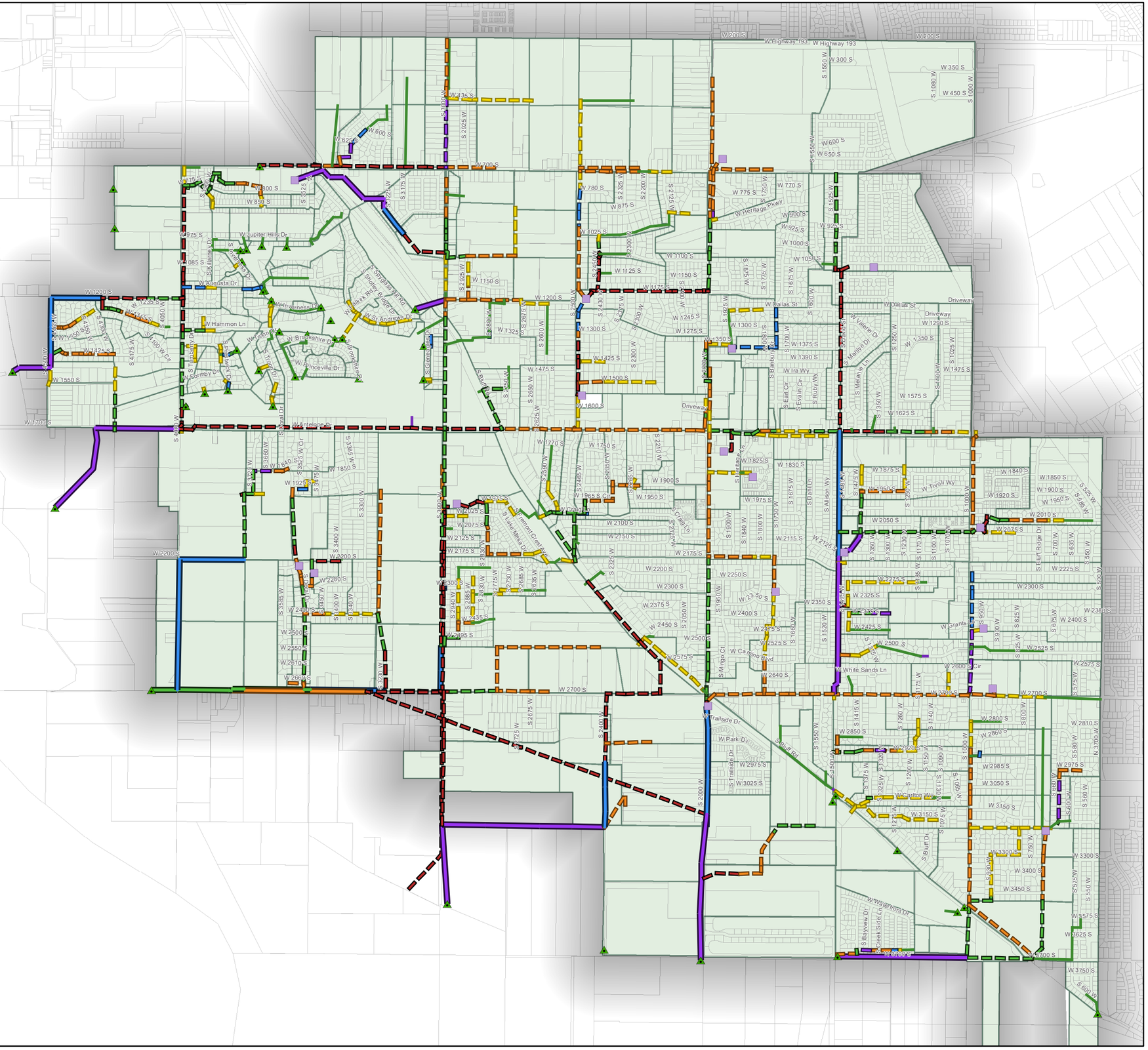
Modeled Future Storm Drain System With Improvements

Figure 4

0 1,000 2,000 Feet

- Storage
- Outfall
- Subcatchments

4"	18"	40"
8"	21"	42"
10"	24"	45"
12"	27"	48"
15"	30"	54"
16"	36"	



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Syracuse

Modeled Future Peak Flow Rates (cfs)

Figure 5

0 1,000 2,000 Feet

Storage

Outfall

Subcatchments

4"	18"	40"
8"	21"	42"
10"	24"	45"
12"	27"	48"
15"	30"	54"
16"	36"	

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Syracuse City - Storm Drain IFFP
Project Breakdown
Revision Date: July 2020

Table B-1

Project Number	Project Location	New Development	Development Base Cost	Existing Contribution	10-Yr Growth Contribution	Growth Beyond 10 Year	IFFP Cost
SD-01	1700 S Bluff RD	$ 2,287,000	$ -	0%	100%	0%	$ 2,287,000
SD-02	3000 W 1325 S	$ 125,000	$ -	30%	70%	0%	$ 87,500
SD-03	650 S 3500 W	$ -	$ 447,000	0%	100%	0%	$ -
SD-04	600 S 3175 W	$ -	$ 750,000	0%	100%	0%	$ -
SD-05	435 S 3000 W	$ 32,620	$ 606,566	0%	100%	0%	$ 32,620
SD-06	3000 S 2400 W	$ 6,120,000	$ -	30%	70%	0%	$ 4,284,000
SD-07	700 S 2750 W	$ 782,000	$ -	10%	90%	0%	$ 703,800
SD-08	3000 W 3500 S	$ 1,548,000	$ -	30%	70%	0%	$ 1,083,600
SD-09	2500 S 2675 W	$ 162,808	$ 1,052,571	0%	0%	100%	$ -
SD-10	2700 S 3000 W	$ 2,011,000	$ -	30%	70%	0%	$ 1,407,700
SD-11	2500 W 435 S	$ 26,384	$ 874,169	0%	100%	0%	$ 26,384
SD-12	Bluff Rd 1550 W	$ 589,000	$ -	50%	50%	0%	$ 294,500
SD-13	2000 W 3200 S	$ 673,000	$ -	90%	10%	0%	$ 67,300
SD-14	1900 W 3300 S	$ 245,979	$ 784,968	0%	100%	0%	$ 245,979
SD-15	2700 S 3720 W	$ 1,012,000	$ -	40%	25%	35%	$ 253,000
SD-16	2700 S 3230 W	$ 362,346	$ 1,462,895	0%	0%	100%	$ -
SD-17	700 S 3600 W	-	-	-	-	-	-
SD-18A	1700 S 4000 W	$ 1,145,000	$ -	70%	30%	0%	$ 343,500
SD-18B	1700 S 4300 W	$ 1,305,583	$ -	70%	0%	30%	$ -
SD-19	2200 S 3720 W	$ 1,110,498	$ 1,882,853	30%	70%	0%	$ 777,348.44
SD-20	3700 S 1425 W	$ 1,393,000	$ -	0%	0%	100%	$ -
SD-21	700 W Bluff Rd.	$ 219,785	$ 963,370	0%	0%	100%	$ -
SD-22	3000 W 1000 S	$ 74,378	$ 856,329	0%	0%	100%	$ -
	TOTAL	**$ 21,225,379**	**$ 9,680,721**				**$ 11,894,232**

Syracuse City - Storm Drain IFFP
Project Schedule
Revision Date: July 2020

Table B-2

Project Number	Project Location	0-5 Years (2019-2024)		5-10 Years (2025-2030)		Beyond 10 Years	
		New Development	Development Base Cost	New Development	Development Base Cost	New Development	Development Base Cost
SD-01	1700 S Bluff RD	$ 2,287,000	$ -				
SD-02	3000 W 1325 S	$ 125,000	$ -				
SD-03	650 S 3500 W	$ -	$ 447,000				
SD-04	600 S 3175 W	$ -	$ 750,000				
SD-05	435 S 3000 W	$ 32,620	$ 606,566				
SD-06	3000 S 2400 W	$ 6,120,000	$ -				
SD-07	700 S 2750 W	$ 782,000	$ -				
SD-08	3000 W 3500 S	$ 1,548,000	$ -				
SD-09	2500 S 2675 W					$ 162,808	$ 1,052,571
SD-10	2700 S 3000 W			$ 2,011,000	$ -		
SD-11	2500 W 435 S			$ 26,384	$ 874,169		
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SD-17	700 S 3600 W						
SD-18A	1700 S 4000 W			$ 1,144,067	$ -		
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SD-19	2200 S 3720 W	$ 1,110,498	$ 1,882,853				
SD-20	3700 S 1425 W					$ 1,393,000	$ -
SD-21	700 W Bluff Rd.					$ 219,785	$ 963,370
SD-22	3000 W 1000 S					$ 74,378	$ 856,329
	TOTAL	**$ 12,005,118**	**$ 3,686,419**	**$ 5,701,430**	**$ 1,659,137**	**$ 3,357,316**	**$ 4,335,165**

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

1 - Enter the Project Description in the space provided below in the Project Summary Table.	**udot.gov website with current CCI**
2 - Enter Current Construction Cost Index (CCI) given on the udot.gov website. Access the site by clicking on the link shown in the cell to the right.	http://www.udot.utah.gov/main/f?p=100:pg:0::::T,V:1400,
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Old CCI:** 236 **Fourth Quarter 2010** **Current CCI:** **387.3** First Quarter 2018
4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).	

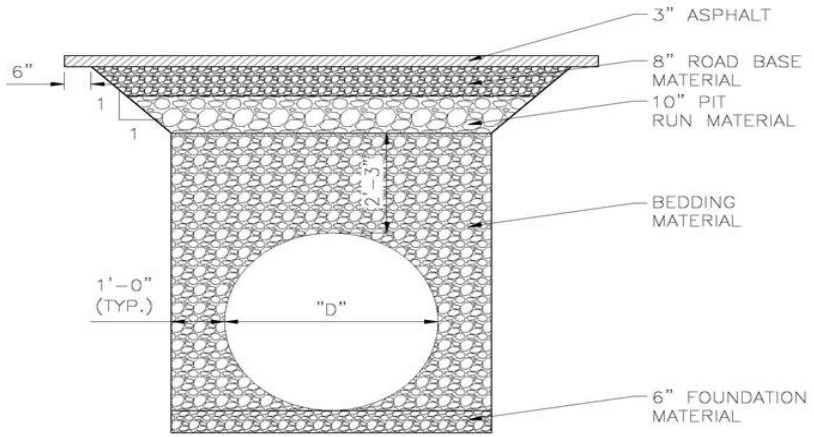
5 - If you have current up-to-date costs to install the pipe sizes you need for your project along with costs for imported materials and junction boxes, then you could copy this spreadsheet and enter a current CCI that is equal to the old CCI and enter the updated unit costs in the yellow fields. If you follow this procedure, you should update the old CCI field with the current value from udot for future reference. MAKE SURE THAT THE OLD CCI VALUE IS EQUAL TO THE CURRENT CCI VALUE IF YOU CHOOSE TO FOLLOW THIS PROCEDURE.

PROJECT SUMMARY TABLE

Project 1
1700 S Bluff RD

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
24	3,900.00	$1,606,771.94
30	1,450.00	$679,487.56
Pipeline Total:		**$2,287,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.

2) Trench section for pipes will match the drawing shown above.

3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.

4) All new pipes will be installed under asphalt.

5) Junction boxes will be installed every 400 feet.

6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

[1] Estimated that 1 existing water main will have to be looped for each block of new storm drain line installed.

[2] Estimated that 1 water service line will have to be looped for every 66 feet of new storm drain line installed.

[3] Estimated that if new storm drain lines are larger than 48" existing sewer services will not fit under storm drain. A new 8" sewer main will be installed in the raod to serve homes on 1 side of the road.

[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

1 - Enter the Project Description in the space provided below in the Project Summary Table.	**udot.gov website with current CCI**
2 - Enter Current Construction Cost Index (CCI) given on the udot.gov website. Access the site by clicking on the link shown in the cell to the right.	http://www.udot.utah.gov/main/f?p=100:pg:0::::T,V:1400,

	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018
4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).			

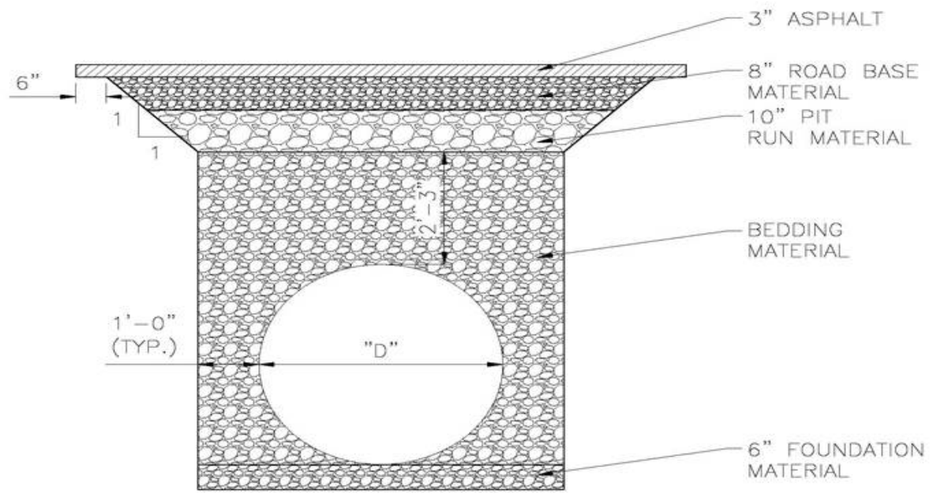
5 - If you have current up-to-date costs to install the pipe sizes you need for your project along with costs for imported materials and junction boxes, then you could copy this spreadsheet and enter a current CCI that is equal to the old CCI and enter the updated unit costs in the yellow fields. If you follow this procedure, you should update the old CCI field with the current value from udot for future reference. MAKE SURE THAT THE OLD CCI VALUE IS EQUAL TO THE CURRENT CCI VALUE IF YOU CHOOSE TO FOLLOW THIS PROCEDURE.

PROJECT SUMMARY TABLE

Project 2
3000 W 1325 S

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
15	350.00	$124,881.29
Pipeline Total:	**$125,000**	

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.
2) Trench section for pipes will match the drawing shown above.
3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.
4) All new pipes will be installed under asphalt.
5) Junction boxes will be installed every 400 feet.
6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

[1] Estimated that 1 existing water main will have to be looped for each block of new storm drain line installed.

[2] Estimated that 1 water service line will have to be looped for every 66 feet of new storm drain line installed.

[3] Estimated that if new storm drain lines are larger than 48" existing sewer services will not fit under storm drain. A new 8" sewer main will be installed in the raod to serve homes on 1 side of the road.

[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

1 - Enter the Project Description in the space provided below in the Project Summary Table.	**udot.gov website with current CCI**
2 - Enter Current Construction Cost Index (CCI) given on the udot.gov website. Access the site by clicking on the link shown in the cell to the right.	http://www.udot.utah.gov/main/f?p=100:pg:0::::T,V:1400,

	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018
4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).			

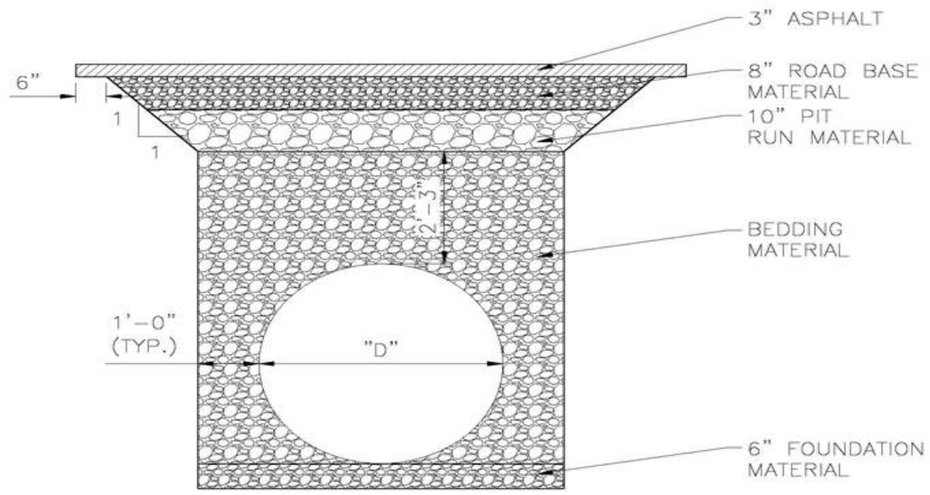
5 - If you have current up-to-date costs to install the pipe sizes you need for your project along with costs for imported materials and junction boxes, then you could copy this spreadsheet and enter a current CCI that is equal to the old CCI and enter the updated unit costs in the yellow fields. If you follow this procedure, you should update the old CCI field with the current value from udot for future reference. MAKE SURE THAT THE OLD CCI VALUE IS EQUAL TO THE CURRENT CCI VALUE IF YOU CHOOSE TO FOLLOW THIS PROCEDURE.

PROJECT SUMMARY TABLE

Project 3
650 S 3500 W

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
15	1,250.00	$446,004.61
Pipeline Total:		**$447,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.
2) Trench section for pipes will match the drawing shown above.
3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.
4) All new pipes will be installed under asphalt.
5) Junction boxes will be installed every 400 feet.
6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

[1] Estimated that 1 existing water main will have to be looped for each block of new storm drain line installed.

[2] Estimated that 1 water service line will have to be looped for every 66 feet of new storm drain line installed.

[3] Estimated that if new storm drain lines are larger than 48" existing sewer services will not fit under storm drain. A new 8" sewer main will be installed in the raod to serve homes on 1 side of the road.

[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

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2 - Enter Current Construction Cost Index (CCI) given on the udot.gov website. Access the site by clicking on the link shown in the cell to the right.	http://www.udot.utah.gov/main/f?p=100:pg:0::::T,V:1400,		
	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018
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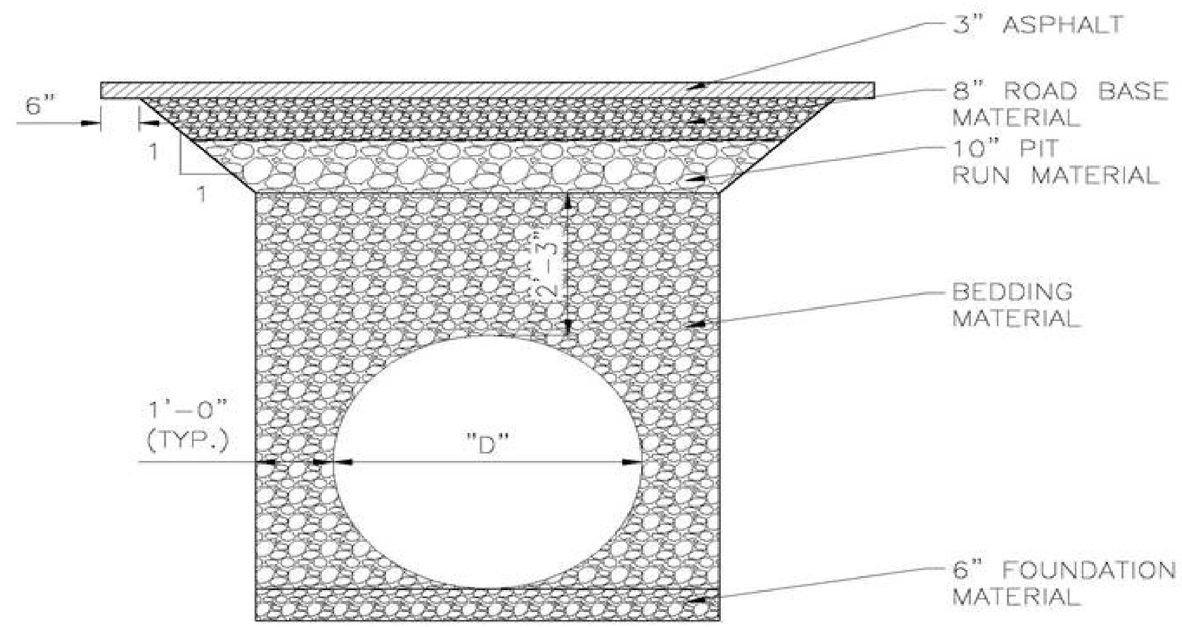
PROJECT SUMMARY TABLE		
Project 4		
	600 S 3175 W	
Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
15	2,100.00	$749,287.74
Pipeline Total:		$750,000

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.

2) Trench section for pipes will match the drawing shown above.

3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.

4) All new pipes will be installed under asphalt.

5) Junction boxes will be installed every 400 feet.

6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

[1] Estimated that 1 existing water main will have to be looped for each block of new storm drain line installed.

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[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

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2 - Enter Current Construction Cost Index (CCI) given on the udot.gov website. Access the site by clicking on the link shown in the cell to the right.	http://www.udot.utah.gov/main/f?p=100:pg:0::::T,V:1400,

	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018
4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).			

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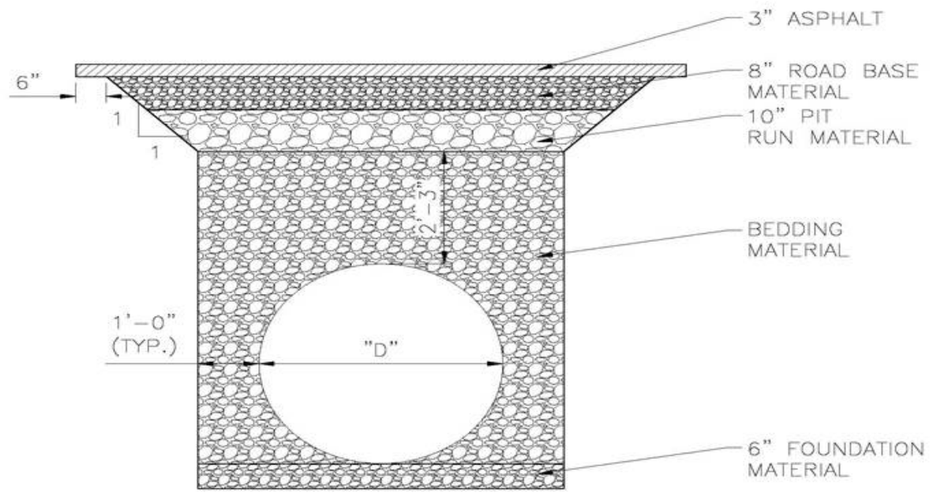
PROJECT SUMMARY TABLE

Project 5
435 S 3000 W

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
18	1,700.00	$639,186.66
15	1,700.00	$606,566.26
Pipeline Total:		**$1,246,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.
2) Trench section for pipes will match the drawing shown above.
3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.
4) All new pipes will be installed under asphalt.
5) Junction boxes will be installed every 400 feet.
6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

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[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

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2 - Enter Current Construction Cost Index (CCI) given on the udot.gov website. Access the site by clicking on the link shown in the cell to the right.	http://www.udot.utah.gov/main/f?p=100:pg:0::::T,V:1400,

	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018
4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).			

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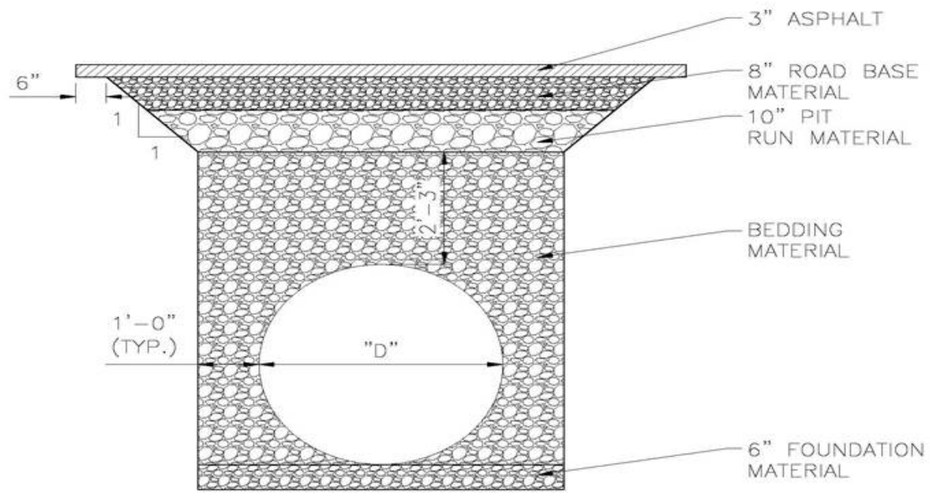
PROJECT SUMMARY TABLE

Project 6
3000 S 2400 W

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
24	1,700.00	$700,387.77
36	5,350.00	$2,811,217.70
42	700.00	$420,266.27
48	3,250.00	$2,187,187.49
Pipeline Total:		**$6,120,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.
2) Trench section for pipes will match the drawing shown above.
3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.
4) All new pipes will be installed under asphalt.
5) Junction boxes will be installed every 400 feet.
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[1] Estimated that 1 existing water main will have to be looped for each block of new storm drain line installed.

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[3] Estimated that if new storm drain lines are larger than 48" existing sewer services will not fit under storm drain. A new 8" sewer main will be installed in the raod to serve homes on 1 side of the road.

[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

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	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018

4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).

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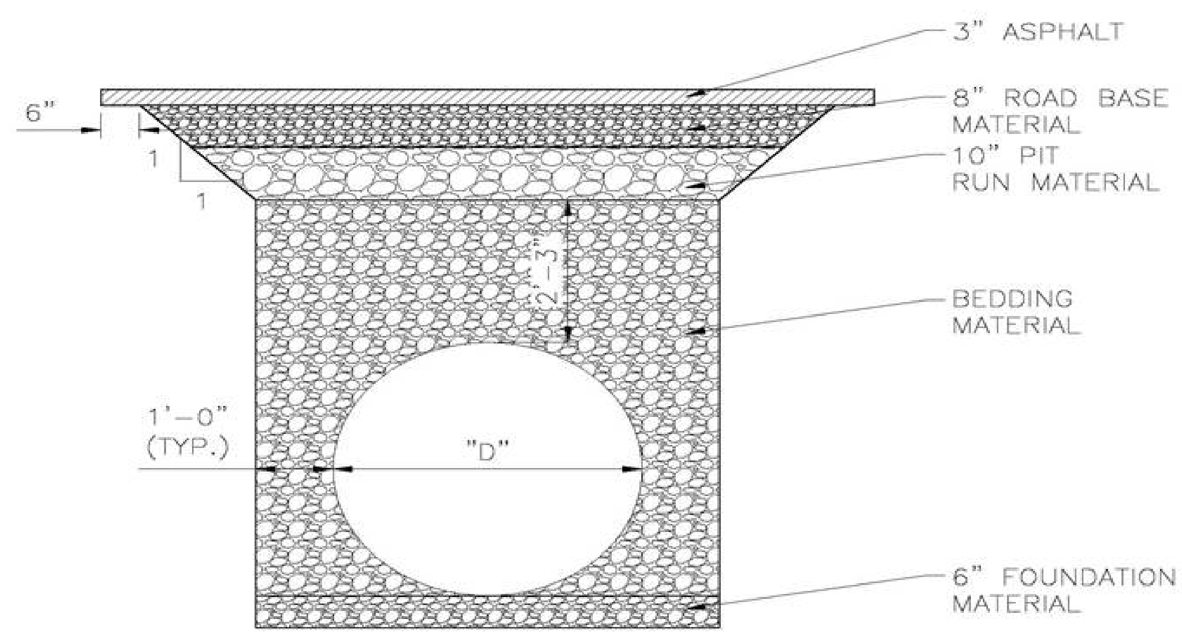
PROJECT SUMMARY TABLE		
Project 7 700 S 2750 W		
Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
24R	1,750.00	$781,198.82
Pipeline Total:		**$782,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.

2) Trench section for pipes will match the drawing shown above.

3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.

4) All new pipes will be installed under asphalt.

5) Junction boxes will be installed every 400 feet.

6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

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[3] Estimated that if new storm drain lines are larger than 48" existing sewer services will not fit under storm drain. A new 8" sewer main will be installed in the raod to serve homes on 1 side of the road.

[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

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	Old CCI:	236	Fourth Quarter 2010
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	Current CCI:	387.3	First Quarter 2018

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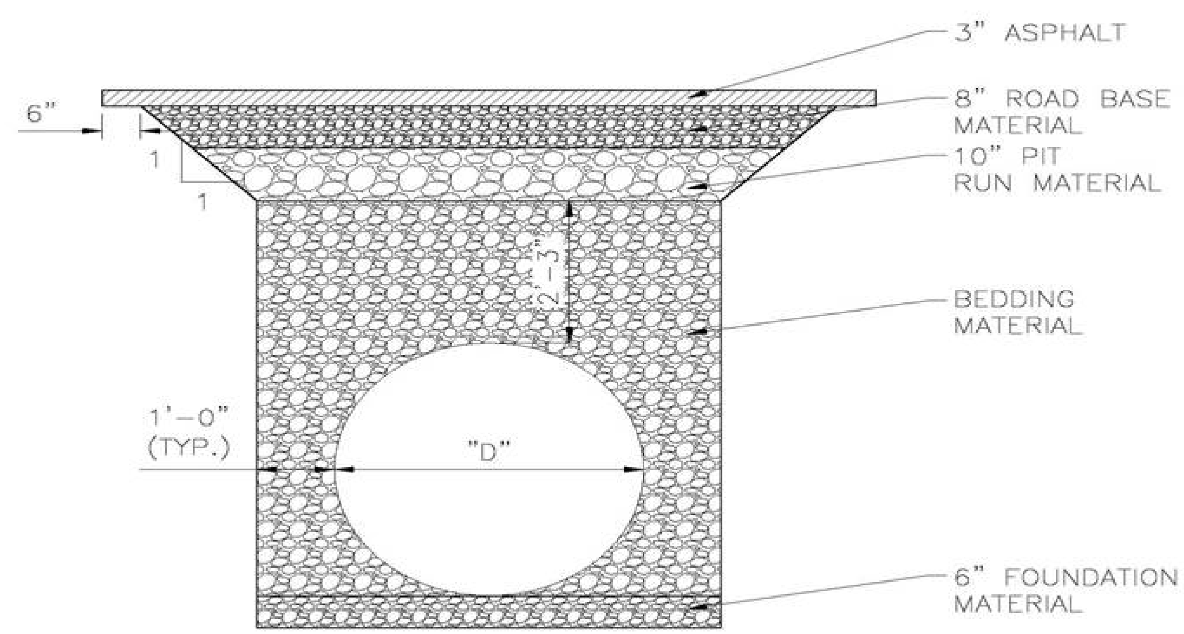
PROJECT SUMMARY TABLE		
Project 8 3000 W 3500 S		
Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
48	2,300.00	$1,547,855.76
Pipeline Total:		**$1,548,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.

2) Trench section for pipes will match the drawing shown above.

3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.

4) All new pipes will be installed under asphalt.

5) Junction boxes will be installed every 400 feet.

6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

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[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

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	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018
4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).			

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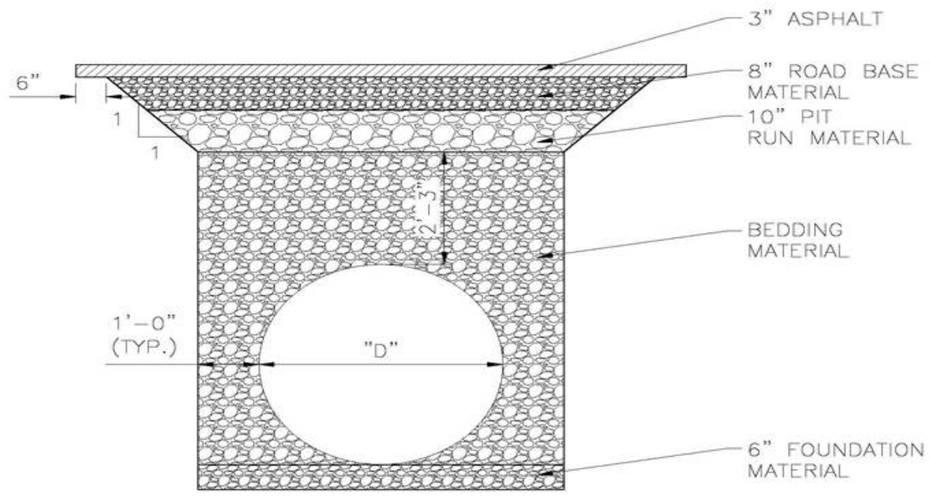
PROJECT SUMMARY TABLE

Project 9
2500 S 2675 W

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
15	2,950.00	$1,052,570.87
24	2,950.00	$1,215,378.77
Pipeline Total:		**$2,268,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.
2) Trench section for pipes will match the drawing shown above.
3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.
4) All new pipes will be installed under asphalt.
5) Junction boxes will be installed every 400 feet.
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Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

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	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018

4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).

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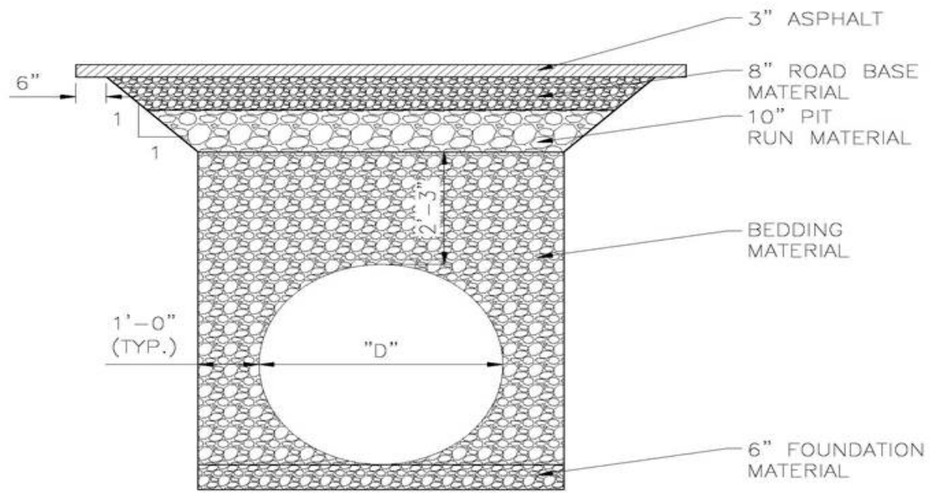
PROJECT SUMMARY TABLE

Project 10
2700 S 3000 W

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
24	1,025.00	$422,292.62
30	950.00	$445,181.50
36	2,175.00	$1,142,878.22
Pipeline Total:		**$2,011,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.
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3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.
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Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

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	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018

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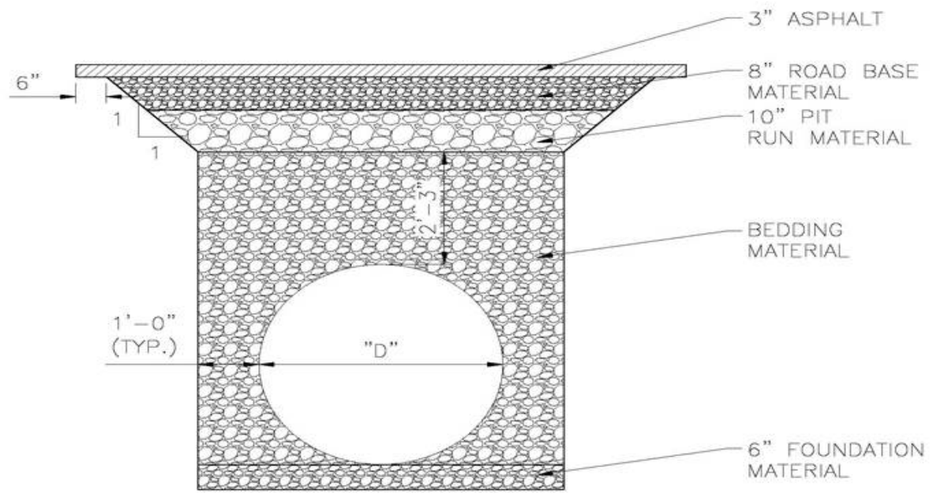
PROJECT SUMMARY TABLE

Project 11
2500 W 435 S

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
18	1,375.00	$516,989.21
15	1,375.00	$490,605.07
15	1,075.00	$383,563.96
Pipeline Total:		**$1,392,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.
2) Trench section for pipes will match the drawing shown above.
3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.
4) All new pipes will be installed under asphalt.
5) Junction boxes will be installed every 400 feet.
6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

[1] Estimated that 1 existing water main will have to be looped for each block of new storm drain line installed.

[2] Estimated that 1 water service line will have to be looped for every 66 feet of new storm drain line installed.

[3] Estimated that if new storm drain lines are larger than 48" existing sewer services will not fit under storm drain. A new 8" sewer main will be installed in the raod to serve homes on 1 side of the road.

[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

1 - Enter the Project Description in the space provided below in the Project Summary Table.	**udot.gov website with current CCI**
2 - Enter Current Construction Cost Index (CCI) given on the udot.gov website. Access the site by clicking on the link shown in the cell to the right.	http://www.udot.utah.gov/main/f?p=100:pg:0::::T,V:1400,

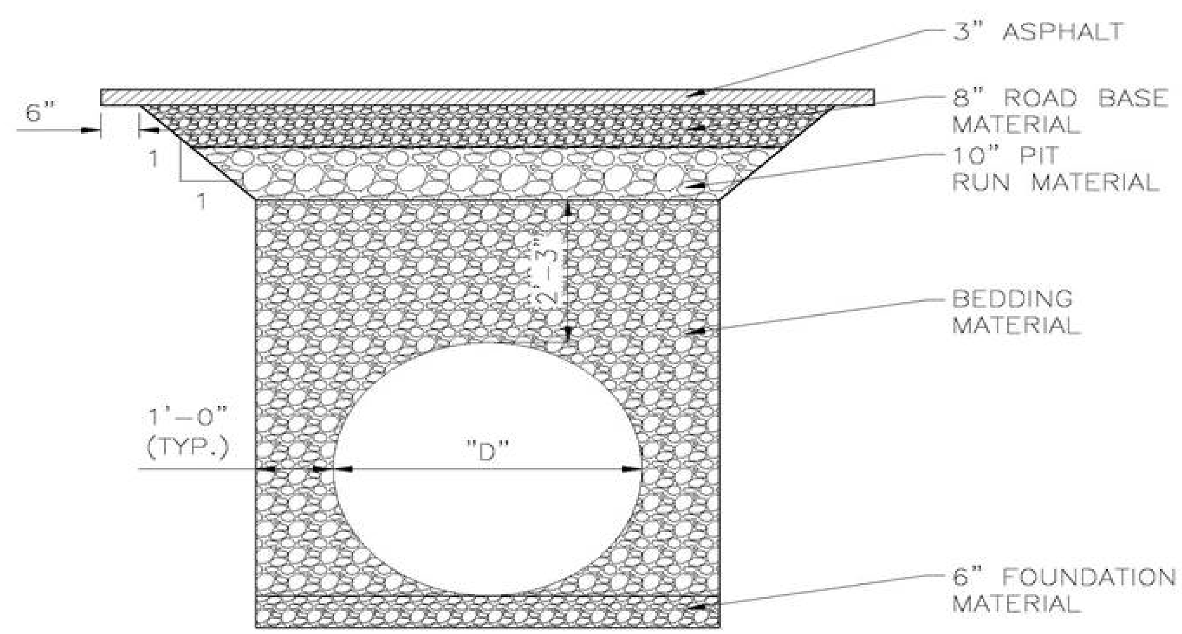
	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018

4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).

5 - If you have current up-to-date costs to install the pipe sizes you need for your project along with costs for imported materials and junction boxes, then you could copy this spreadsheet and enter a current CCI that is equal to the old CCI and enter the updated unit costs in the yellow fields. If you follow this procedure, you should update the old CCI field with the current value from udot for future reference. MAKE SURE THAT THE OLD CCI VALUE IS EQUAL TO THE CURRENT CCI VALUE IF YOU CHOOSE TO FOLLOW THIS PROCEDURE.

PROJECT SUMMARY TABLE		
Project 12 Bluff Rd 1550 W		
Diam. (in)	**Estimated Pipe Length (ft)**	**Current Opinion of Probable Cost**
15	1,650.00	$588,726.08
Pipeline Total:		**$589,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.

2) Trench section for pipes will match the drawing shown above.

3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.

4) All new pipes will be installed under asphalt.

5) Junction boxes will be installed every 400 feet.

6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

[1] Estimated that 1 existing water main will have to be looped for each block of new storm drain line installed.

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[3] Estimated that if new storm drain lines are larger than 48" existing sewer services will not fit under storm drain. A new 8" sewer main will be installed in the raod to serve homes on 1 side of the road.

[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

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2 - Enter Current Construction Cost Index (CCI) given on the udot.gov website. Access the site by clicking on the link shown in the cell to the right.	http://www.udot.utah.gov/main/f?p=100:pg:0::::T,V:1400,

	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018

4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).

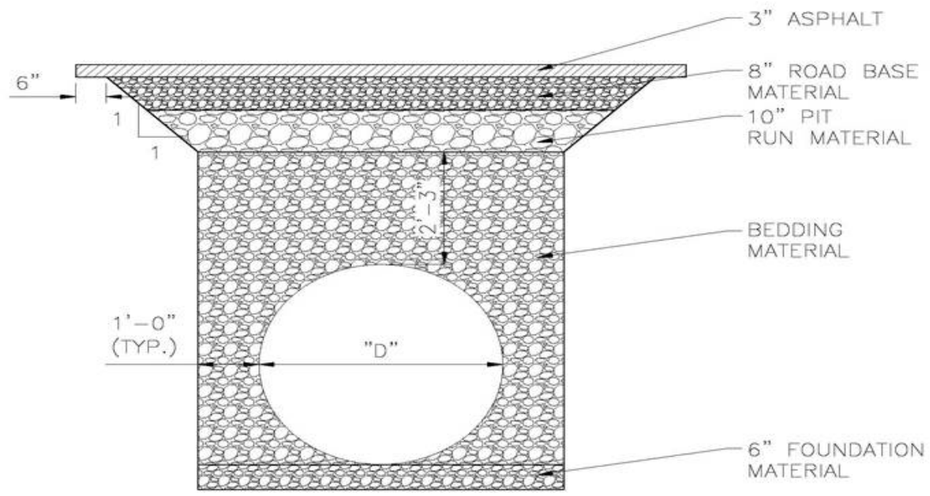
5 - If you have current up-to-date costs to install the pipe sizes you need for your project along with costs for imported materials and junction boxes, then you could copy this spreadsheet and enter a current CCI that is equal to the old CCI and enter the updated unit costs in the yellow fields. If you follow this procedure, you should update the old CCI field with the current value from udot for future reference. MAKE SURE THAT THE OLD CCI VALUE IS EQUAL TO THE CURRENT CCI VALUE IF YOU CHOOSE TO FOLLOW THIS PROCEDURE.

PROJECT SUMMARY TABLE

Project 13
2000 W 3200 S

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
48	1,000.00	$672,980.77
Pipeline Total:	**$673,000**	

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.
2) Trench section for pipes will match the drawing shown above.
3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.
4) All new pipes will be installed under asphalt.
5) Junction boxes will be installed every 400 feet.
6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

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[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

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	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018

4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).

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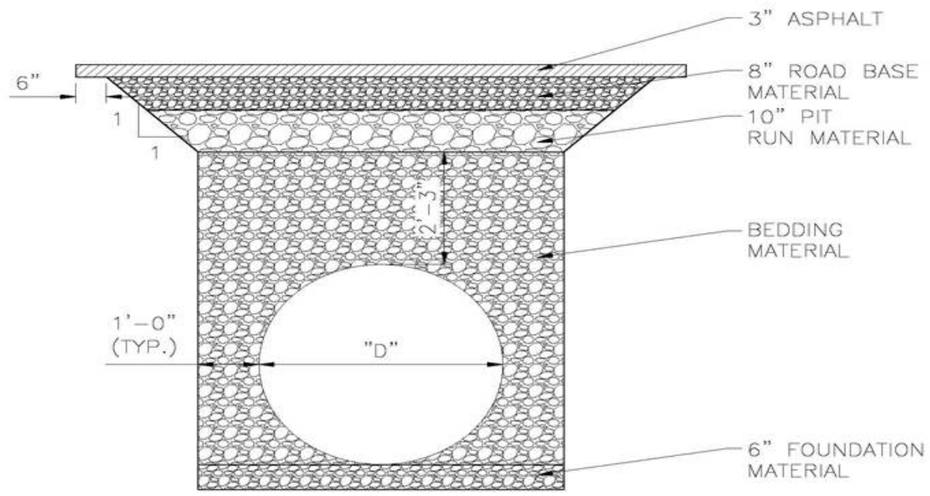
PROJECT SUMMARY TABLE

Project 14
1900 W 3300 S

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
15	2,200.00	$784,968.11
30	2,200.00	$1,030,946.64
Pipeline Total:		**$1,816,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.
2) Trench section for pipes will match the drawing shown above.
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Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

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2 - Enter Current Construction Cost Index (CCI) given on the udot.gov website. Access the site by clicking on the link shown in the cell to the right.	http://www.udot.utah.gov/main/f?p=100:pg:0::::T,V:1400,		
	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018
4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).			

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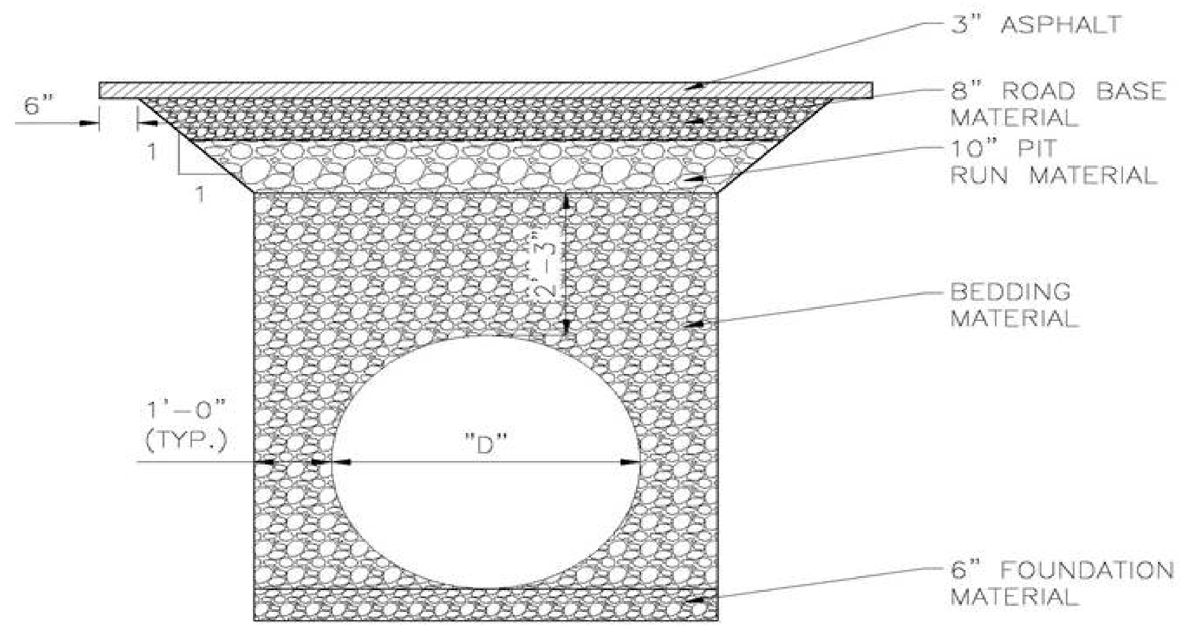
PROJECT SUMMARY TABLE		
Project 15 2700 S 3720 W		
Diam. (in)	**Estimated Pipe Length (ft)**	**Current Opinion of Probable Cost**
54	950.00	$1,011,170.07
Pipeline Total:		**$1,012,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.

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5) Junction boxes will be installed every 400 feet.

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[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

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2 - Enter Current Construction Cost Index (CCI) given on the udot.gov website. Access the site by clicking on the link shown in the cell to the right.	http://www.udot.utah.gov/main/f?p=100:pg:0::::T,V:1400,

	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018
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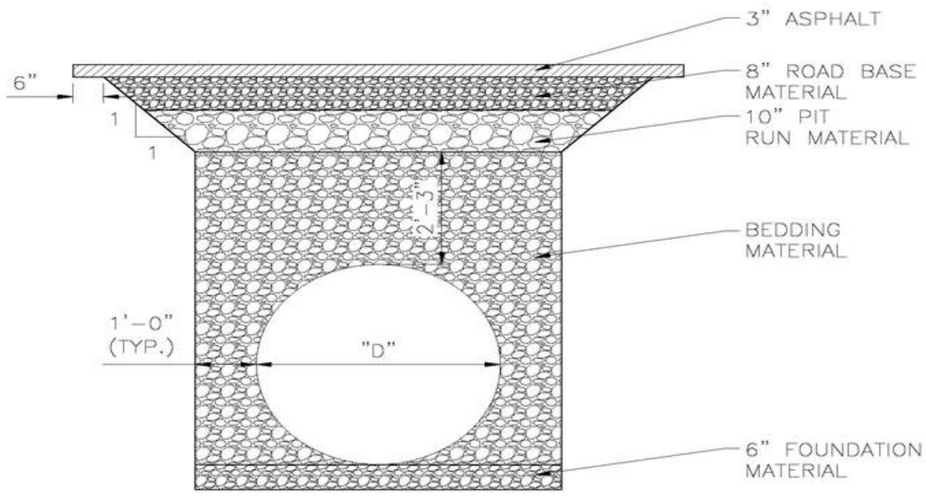
PROJECT SUMMARY TABLE

Project 16
2700 S 3230 W

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
24	2,500.00	$1,029,982.01
30	800.00	$374,889.69
36	800.00	$420,369.00
15	4,100.00	$1,462,895.11
Pipeline Total:		**$3,289,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.

2) Trench section for pipes will match the drawing shown above.

3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.

4) All new pipes will be installed under asphalt.

5) Junction boxes will be installed every 400 feet.

6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

[1] Estimated that 1 existing water main will have to be looped for each block of new storm drain line installed.

[2] Estimated that 1 water service line will have to be looped for every 66 feet of new storm drain line installed.

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[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

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	Old CCI:	236	Fourth Quarter 2010
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	Current CCI:	387.3	First Quarter 2018

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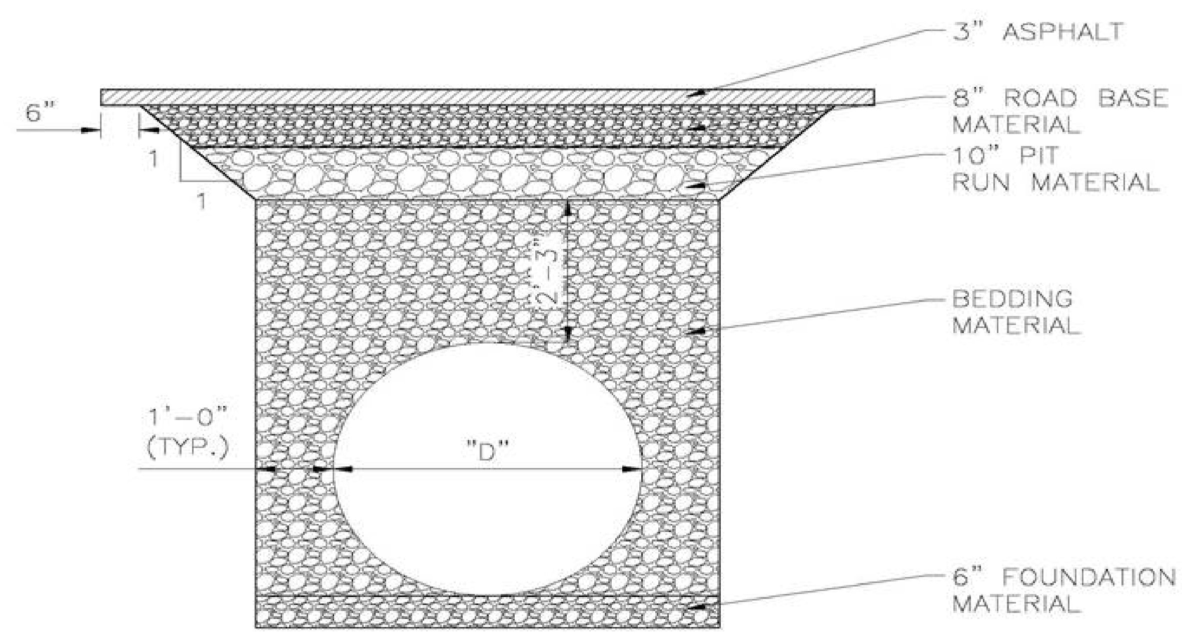
PROJECT SUMMARY TABLE		
Project 17 700 S 3600 W		
Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
36	1,150.00	$604,280.44
Pipeline Total:		$605,000

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.

2) Trench section for pipes will match the drawing shown above.

3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.

4) All new pipes will be installed under asphalt.

5) Junction boxes will be installed every 400 feet.

6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

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Storm Drain Pipe Project Opinion of Probable Cost Calculator

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	Old CCI:	236	Fourth Quarter 2010
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	Current CCI:	387.3	First Quarter 2018
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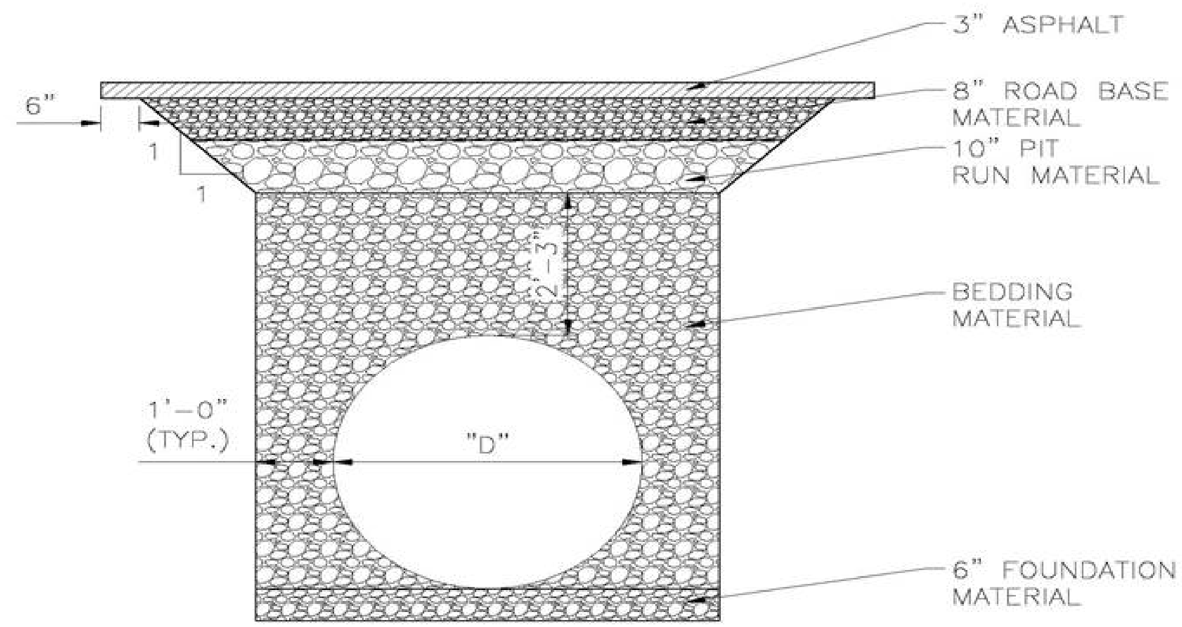
PROJECT SUMMARY TABLE		
Project 18 1700 S 4300 W		
Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
48	3,600.00	$2,422,730.76
Pipeline Total:		$2,423,000

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.

2) Trench section for pipes will match the drawing shown above.

3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.

4) All new pipes will be installed under asphalt.

5) Junction boxes will be installed every 400 feet.

6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

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Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

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Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018

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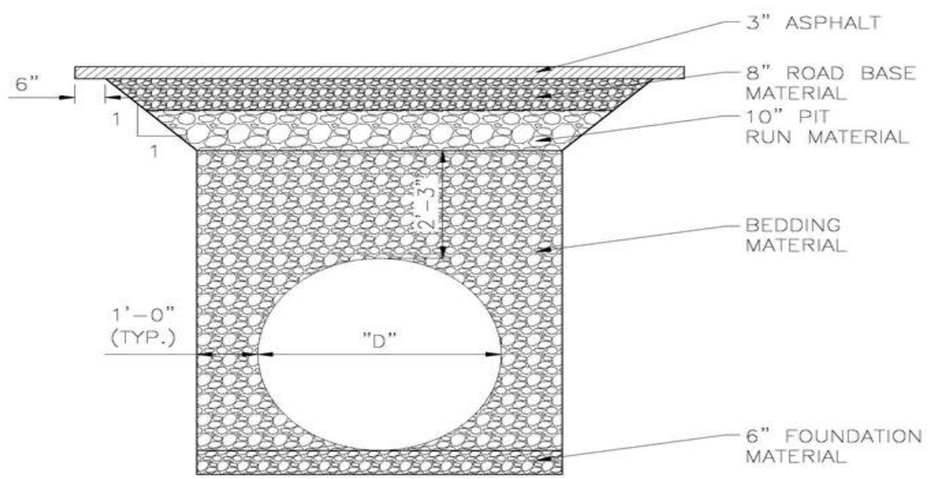
PROJECT SUMMARY TABLE

Project 18A
1700 S 4000 W

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
48	1,700.00	$1,144,067.30
Pipeline Total:		**$1,145,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

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2) Trench section for pipes will match the drawing shown above.
3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.
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Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

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Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018

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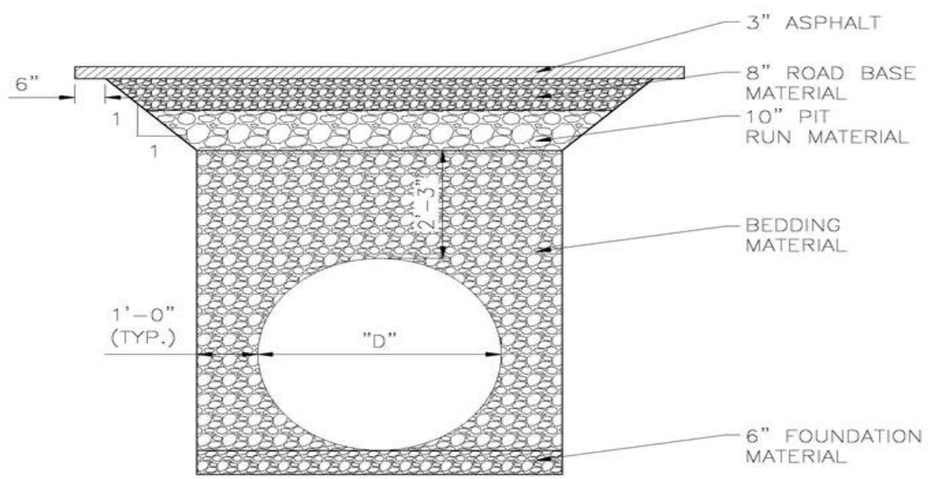
PROJECT SUMMARY TABLE

Project 18B
1700 S 4300 W

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
48	1,940.00	$1,305,582.69
Pipeline Total:		**$1,306,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.
2) Trench section for pipes will match the drawing shown above.
3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.
4) All new pipes will be installed under asphalt.
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Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

1 - Enter the Project Description in the space provided below in the Project Summary Table.	**udot.gov website with current CCI**
2 - Enter Current Construction Cost Index (CCI) given on the udot.gov website. Access the site by clicking on the link shown in the cell to the right.	http://www.udot.utah.gov/main/f?p=100:pg:0::::T,V:1400,

	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018
4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).			

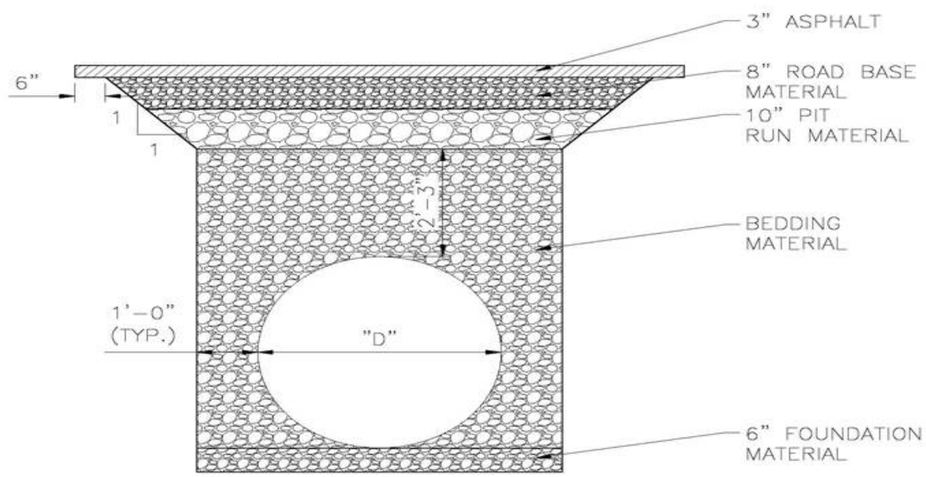
5 - If you have current up-to-date costs to install the pipe sizes you need for your project along with costs for imported materials and junction boxes, then you could copy this spreadsheet and enter a current CCI that is equal to the old CCI and enter the updated unit costs in the yellow fields. If you follow this procedure, you should update the old CCI field with the current value from udot for future reference. MAKE SURE THAT THE OLD CCI VALUE IS EQUAL TO THE CURRENT CCI VALUE IF YOU CHOOSE TO FOLLOW THIS PROCEDURE.

PROJECT SUMMARY TABLE

Project 19
2200 S 3720 W

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
30	1,327.00	$621,848.27
42	3,950.00	$2,371,502.54
15	5,277.00	$1,882,853.04
Pipeline Total:		**$4,877,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.
2) Trench section for pipes will match the drawing shown above.
3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.
4) All new pipes will be installed under asphalt.
5) Junction boxes will be installed every 400 feet.
6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

[1] Estimated that 1 existing water main will have to be looped for each block of new storm drain line installed.

[2] Estimated that 1 water service line will have to be looped for every 66 feet of new storm drain line installed.

[3] Estimated that if new storm drain lines are larger than 48" existing sewer services will not fit under storm drain. A new 8" sewer main will be installed in the raod to serve homes on 1 side of the road.

[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

1 - Enter the Project Description in the space provided below in the Project Summary Table.	**udot.gov website with current CCI**
2 - Enter Current Construction Cost Index (CCI) given on the udot.gov website. Access the site by clicking on the link shown in the cell to the right.	http://www.udot.utah.gov/main/f?p=100:pg:0::::T,V:1400,

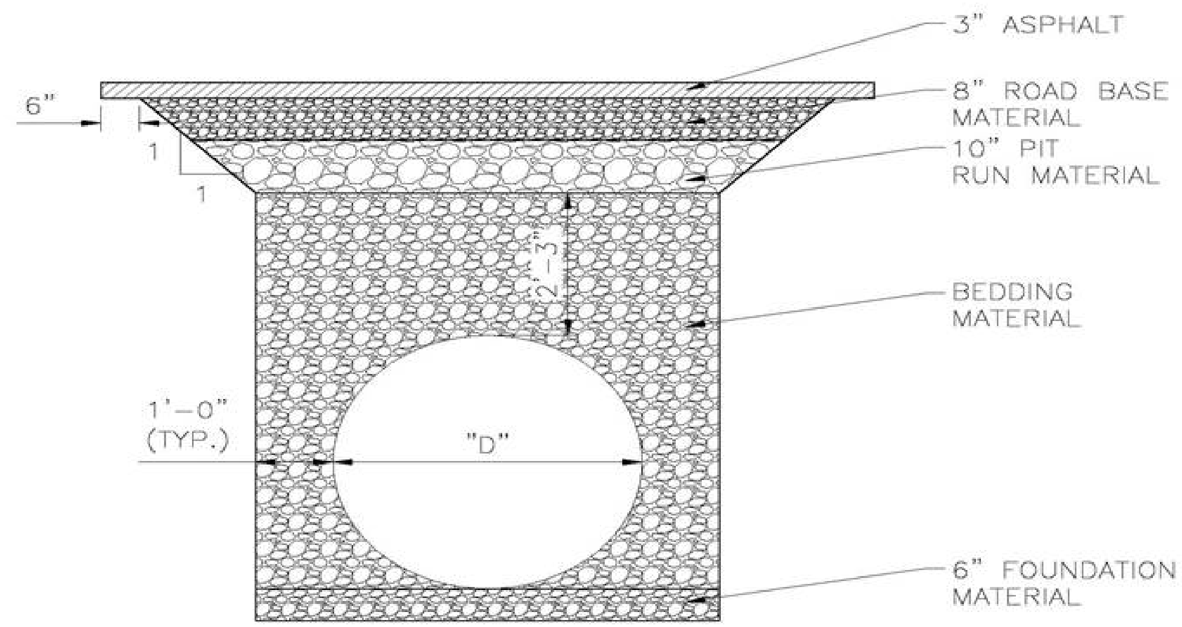
	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018

4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).

5 - If you have current up-to-date costs to install the pipe sizes you need for your project along with costs for imported materials and junction boxes, then you could copy this spreadsheet and enter a current CCI that is equal to the old CCI and enter the updated unit costs in the yellow fields. If you follow this procedure, you should update the old CCI field with the current value from udot for future reference. MAKE SURE THAT THE OLD CCI VALUE IS EQUAL TO THE CURRENT CCI VALUE IF YOU CHOOSE TO FOLLOW THIS PROCEDURE.

PROJECT SUMMARY TABLE		
Project 20 3700 S 1425 W		
Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
36	2,650.00	$1,392,472.32
Pipeline Total:		**$1,393,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.

2) Trench section for pipes will match the drawing shown above.

3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.

4) All new pipes will be installed under asphalt.

5) Junction boxes will be installed every 400 feet.

6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

[1] Estimated that 1 existing water main will have to be looped for each block of new storm drain line installed.

[2] Estimated that 1 water service line will have to be looped for every 66 feet of new storm drain line installed.

[3] Estimated that if new storm drain lines are larger than 48" existing sewer services will not fit under storm drain. A new 8" sewer main will be installed in the raod to serve homes on 1 side of the road.

[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

1 - Enter the Project Description in the space provided below in the Project Summary Table.	**udot.gov website with current CCI**
2 - Enter Current Construction Cost Index (CCI) given on the udot.gov website. Access the site by clicking on the link shown in the cell to the right.	http://www.udot.utah.gov/main/f?p=100:pg:0::::T,V:1400,

	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018
4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).			

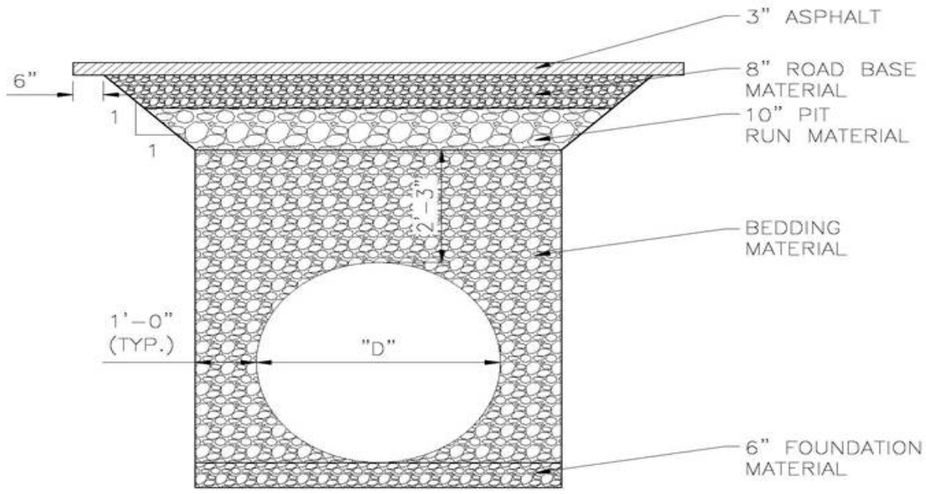
5 - If you have current up-to-date costs to install the pipe sizes you need for your project along with costs for imported materials and junction boxes, then you could copy this spreadsheet and enter a current CCI that is equal to the old CCI and enter the updated unit costs in the yellow fields. If you follow this procedure, you should update the old CCI field with the current value from udot for future reference. MAKE SURE THAT THE OLD CCI VALUE IS EQUAL TO THE CURRENT CCI VALUE IF YOU CHOOSE TO FOLLOW THIS PROCEDURE.

PROJECT SUMMARY TABLE

Project 21
700 W Bluff Rd.

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
15	2,050.00	$731,447.55
24	1,450.00	$597,389.57
30	1,250.00	$585,765.14
15	2,700.00	$963,369.95
Acres	Unit Price	
8.2	100,000.00	$820,000.00
Pipeline Total:		**$3,698,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.

2) Trench section for pipes will match the drawing shown above.

3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.

4) All new pipes will be installed under asphalt.

5) Junction boxes will be installed every 400 feet.

6) The cost to remove an existing line and install a new line will cost 1.25 times the cost to install a new line with no existing line to remove.

[1] Estimated that 1 existing water main will have to be looped for each block of new storm drain line installed.

[2] Estimated that 1 water service line will have to be looped for every 66 feet of new storm drain line installed.

[3] Estimated that if new storm drain lines are larger than 48" existing sewer services will not fit under storm drain. A new 8" sewer main will be installed in the raod to serve homes on 1 side of the road.

[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Storm Drain Pipe Project Opinion of Probable Cost Calculator

Instructions:

1 - Enter the Project Description in the space provided below in the Project Summary Table.	**udot.gov website with current CCI**
2 - Enter Current Construction Cost Index (CCI) given on the udot.gov website. Access the site by clicking on the link shown in the cell to the right.	http://www.udot.utah.gov/main/f?p=100:pg:0::::T,V:1400,

	Old CCI:	236	**Fourth Quarter 2010**
3 - Enter the date of the current CCI in the cell to the right of the current CCI.	**Current CCI:**	**387.3**	First Quarter 2018

4 - Enter the lengths of pipe needed for the project by size in the Project Summary Table. For locations that have existing pipes that are to be replaced, enter the new pipe diameter followed immediately by the letter R (i.e. for a 15" pipe replacing an existing pipe, enter 15R).

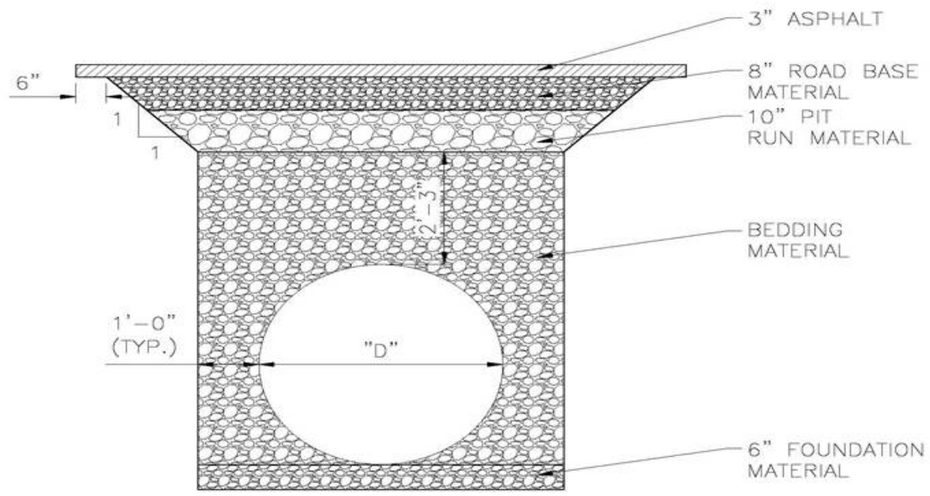
5 - If you have current up-to-date costs to install the pipe sizes you need for your project along with costs for imported materials and junction boxes, then you could copy this spreadsheet and enter a current CCI that is equal to the old CCI and enter the updated unit costs in the yellow fields. If you follow this procedure, you should update the old CCI field with the current value from udot for future reference. MAKE SURE THAT THE OLD CCI VALUE IS EQUAL TO THE CURRENT CCI VALUE IF YOU CHOOSE TO FOLLOW THIS PROCEDURE.

PROJECT SUMMARY TABLE

Project 22
3000 W 1000 S

Diam. (in)	Estimated Pipe Length (ft)	Current Opinion of Probable Cost
15	400.00	$142,721.47
18	1,000.00	$375,992.15
24	1,000.00	$411,992.80
15	2,000.00	$713,607.37
Pipeline Total:		**$1,645,000**

Blue Highlight = Development Base Cost



Assumptions and Calculation Notes:

1) All Pipes will have 4 feet of cover.
2) Trench section for pipes will match the drawing shown above.
3) 6" of foundation material will be imported for half the pipe length. All other imported materials will be used for the full length of pipe.
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[3] Estimated that if new storm drain lines are larger than 48" existing sewer services will not fit under storm drain. A new 8" sewer main will be installed in the raod to serve homes on 1 side of the road.

[4] Estimated that existing gas lines and phone lines will have to be re-located along 25% of the length of the new storm drain lines.

Table C-1 - Farmer & Flecher Storm Distribution

FARMER & FLETCHER STORM DISTRIBUTION

(USE FOR STORMS OF 2 HOURS OR LESS DURATION)

LOCATION: **Syracuse, UT**

TOTAL RAINFALL: **1.000** IN

STORM DURATION: **1.00** HR

% STORM DURATION	TIME (MIN)	% DEPTH	CUMM. DEPTH	INCREM. DEPTH
0	0.00	0	0.000	
5	3.00	18.3	0.183	**0.183**
10	6.00	36.5	0.365	**0.182**
15	9.00	51	0.510	**0.145**
20	12.00	61.5	0.615	**0.105**
25	15.00	70	0.700	**0.085**
30	18.00	76.5	0.765	**0.065**
35	21.00	80.6	0.806	**0.041**
40	24.00	83.9	0.839	**0.033**
45	27.00	86.2	0.862	**0.023**
50	30.00	88	0.880	**0.018**
55	33.00	89.5	0.895	**0.015**
60	36.00	90.8	0.908	**0.013**
65	39.00	92	0.920	**0.012**
70	42.00	93.2	0.932	**0.012**
75	45.00	94.4	0.944	**0.012**
80	48.00	95.6	0.956	**0.012**
85	51.00	96.8	0.968	**0.012**
90	54.00	98	0.980	**0.012**
95	57.00	99	0.990	**0.010**
100	60.00	100	1.000	**0.010**

*Farmer & Fletcher, 1972. "Distribution of Precipitation in Mountainous Areas"

Nearly all sources of research suggest that a first quartile one-hour duration thunder storm is the most critical.

Table C-2 - Existing Excess Pipe Capacity

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-1001	24	21.182	19.344	-1.838
CDT-1003	18	6.36	12.866	6.506
CDT-1005	24	10.728	16.601	5.873
CDT-1007	27	7.254	18.034	10.78
CDT-1009	36	52.571	88.875	36.304
CDT-1011	18	1.896	9.981	8.085
CDT-1013	24	10.737	17.831	7.094
CDT-1015	15	3.042	6.283	3.24
CDT-1017	36	0	51.068	51.068
CDT-1019	30	38.465	46.191	7.727
CDT-1021	15	4.741	3.434	-1.307
CDT-1025	30	50.38	77.971	27.591
CDT-1027	42	46.745	118.684	71.939
CDT-103	15	0	6.217	6.217
CDT-1035	36	52.548	67.88	15.333
CDT-1037	30	0	126.017	126.017
CDT-1039	36	23.506	65.408	41.903
CDT-1041	36	38.043	86.545	48.502
CDT-1043	24	23.582	20.389	-3.193
CDT-1045	30	38.547	31.724	-6.823
CDT-1047	24	20.842	7.729	-13.113
CDT-1049	15	0	5.373	5.373
CDT-105	15	0.934	4.581	3.646
CDT-1051	36	27.338	41.296	13.957
CDT-1053	15	9.913	9.034	-0.879
CDT-1055	24	14.341	11.47	-2.871
CDT-1057	36	10.056	29.006	18.95
CDT-1059	24	15.146	11.529	-3.617
CDT-1061	24	17.729	12.747	-4.983
CDT-1063	30	3.093	15.391	12.298
CDT-1065	30	3.094	27.271	24.176
CDT-1069	36	0	42.957	42.957
CDT-107	15	6.668	6.078	-0.59
CDT-1073	36	49.67	60.085	10.415
CDT-1075	36	34.855	43.35	8.495
CDT-1077	36	27.904	17.215	-10.689
CDT-1079	15	6.568	3.415	-3.153
CDT-1081	15	6.464	1.032	-5.432
CDT-1083	30	11.671	64.208	52.537
CDT-1085	15	7.392	4.714	-2.678
CDT-1087	24	7.487	7.181	-0.306
CDT-1089	30	7.576	53.027	45.452

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-291	18	0.357	5.071	4.714
CDT-293	18	0.077	6.766	6.689
CDT-295	18	0.069	3.077	3.008
CDT-297	36	44.821	53.711	8.89
CDT-299	18	0.927	3.386	2.458
CDT-303	18	4.694	4.171	-0.523
CDT-305	18	0.87	2.262	1.392
CDT-307	54	30.205	184.741	154.536
CDT-309	18	1.014	5.512	4.498
CDT-311	18	0.288	3.204	2.917
CDT-313	18	0.603	9.25	8.647
CDT-319	18	1.023	2.973	1.95
CDT-321	18	0	8.221	8.221
CDT-323	15	4.283	4.458	0.174
CDT-325	21	1.14	19.094	17.954
CDT-33	30	23.956	87.957	64.001
CDT-333	18	5.936	2.507	-3.428
CDT-337	21	5.693	18.614	12.921
CDT-339	15	4.091	1.093	-2.998
CDT-341	18	5.933	2.38	-3.553
CDT-343	24	4.321	20.652	16.331
CDT-345	24	8.37	20.418	12.048
CDT-347	24	0.495	11.825	11.33
CDT-349	18	0	9.425	9.425
CDT-35	12	0.489	1.24	0.751
CDT-351	18	2.989	8.734	5.746
CDT-353	24	1.98	13.369	11.389
CDT-355	24	10.409	14.489	4.08
CDT-357	24	9.793	7.591	-2.202
CDT-359	24	8.927	13.378	4.45
CDT-361	15	5.73	5.782	0.052
CDT-363	24	21.232	33.226	11.994
CDT-365	24	9.485	8.86	-0.625
CDT-367	24	9.012	12.931	3.919
CDT-369	24	1.117	13.541	12.424
CDT-37	15	2.755	5.26	2.505
CDT-371	24	9.965	15.491	5.525
CDT-373	24	8.988	13.37	4.382
CDT-375	24	8.979	13.371	4.392
CDT-377	24	3.428	6.035	2.607
CDT-379	24	0.564	13.605	13.041
CDT-381	24	10.742	21.384	10.642

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-109	15	0.363	2.681	2.318
CDT-1091	24	6.458	11.573	5.115
CDT-1095	30	29.085	24.506	-4.578
CDT-1097	24	6.395	6.321	-0.074
CDT-1099	18	4.637	3.44	-1.197
CDT-11	36	21.067	54.359	33.292
CDT-1101	27	10.705	30.478	19.773
CDT-1105	24	10.749	15.306	4.557
CDT-1109	42	30.971	24.549	-6.423
CDT-111	15	1.672	3.299	1.627
CDT-1111	42	36.612	42.562	5.95
CDT-1113	18	16.268	10.472	-5.796
CDT-1115	18	2.088	11.775	9.686
CDT-1117	18	0.215	12.804	12.589
CDT-1119	36	27.308	32.604	5.296
CDT-1121	36	27.649	70.643	42.994
CDT-1123	42	46.769	37.772	-8.997
CDT-1125	36	32.897	68.666	35.769
CDT-1127	15	1.164	8.342	7.178
CDT-113	30	4.279	33.058	28.779
CDT-1131	15	4.281	6.393	2.112
CDT-1133	15	2.724	5.06	2.337
CDT-1135	30	11.673	35.636	23.963
CDT-1137	15	4.7	6.439	1.739
CDT-1139	18	9.145	4.168	-4.977
CDT-1141	36	17.717	30.539	12.822
CDT-1143	30	17.796	22.19	4.395
CDT-1145	36	35.317	34.105	-1.212
CDT-1147	24	3.329	18.496	15.168
CDT-1149	30	0.7	111.806	111.106
CDT-115	24	0	38.18	38.18
CDT-1151	18	0.161	14.128	13.967
CDT-1153	8.004	0	2.128	2.128
CDT-1155	24	16.962	17.369	0.407
CDT-1157	24	22.713	22.506	-0.206
CDT-1159	18	5.003	3.186	-1.817
CDT-1161	18	9.133	10.321	1.187
CDT-1163	36	1.989	47.732	45.743
CDT-117	24	13.99	16.027	2.037
CDT-1173	24	28.881	24.762	-4.12
CDT-1175	18	0	4.268	4.268
CDT-1177	24	0	15.574	15.574
CDT-1179	24	0	13.389	13.389
CDT-1181	24	12.567	14.095	1.527

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-383	24	0	12.296	12.296
CDT-385	24	12.412	14.232	1.82
CDT-387	24	9.007	11.016	2.009
CDT-389	24	6.349	11.36	5.011
CDT-39	15	0	2.959	2.959
CDT-391	24	3.118	5.941	2.823
CDT-393	24	26.009	20.849	-5.16
CDT-395	24	0	12.257	12.257
CDT-397	24	8.962	13.352	4.39
CDT-399	24	18.947	7.658	-11.289
CDT-401	18	0	5.034	5.034
CDT-403	24	11.292	6.577	-4.714
CDT-405	24	0.106	7.515	7.409
CDT-407	24	0.122	13.125	13.003
CDT-409	24	0	14.569	14.569
CDT-413	24	9.45	7.672	-1.778
CDT-415	24	14.566	15.565	0.999
CDT-417	24	0	12.385	12.385
CDT-419	24	13.671	28.725	15.054
CDT-421	24	8.943	13.304	4.361
CDT-423	24	16.238	18.224	1.985
CDT-425	24	25.342	15.225	-10.116
CDT-427	24	0.681	5.051	4.37
CDT-429	30	38.315	32.828	-5.488
CDT-43	15	0	6.675	6.675
CDT-431	24	2.409	13.482	11.073
CDT-433	24	20.826	16.282	-4.544
CDT-435	24	7.4	9.839	2.439
CDT-437	24	8.951	13.067	4.116
CDT-439	24	8.933	14.553	5.62
CDT-441	24	3.791	8.585	4.793
CDT-443	18	3.967	7.507	3.54
CDT-445	30	35.917	16.524	-19.393
CDT-447	30	35.958	32.921	-3.037
CDT-449	24	17.015	15.961	-1.054
CDT-45	15	0.417	3.056	2.639
CDT-451	24	20.72	21.625	0.905
CDT-453	24	5.523	13.057	7.533
CDT-457	30	1.894	56.549	54.655
CDT-459	27	13.483	32.263	18.78
CDT-461	27	9.106	4.945	-4.161
CDT-463	24	17.491	21.861	4.37
CDT-465	27	13.42	11.367	-2.052
CDT-467	18	0.518	7.254	6.736

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-1185	30	9.47	15.143	5.672
CDT-1189	36	22.247	31.199	8.952
CDT-119	15	13.941	11.676	-2.264
CDT-1195	36	22.092	13.275	-8.817
CDT-1197	15	0	5.434	5.434
CDT-1201	24	6.355	2.837	-3.518
CDT-1203	15	3.949	5.065	1.116
CDT-1205	36	58.266	126.03	67.764
CDT-1207	18	6.827	7.809	0.982
CDT-121	24	12.534	37.825	25.292
CDT-1211	24	3.997	20.984	16.987
CDT-1213	24	0	10.082	10.082
CDT-1217	36	17.078	28.362	11.283
CDT-1219	24	10.236	15.25	5.014
CDT-1220	15	3.944	8.835	4.892
CDT-1221	18	0	10.247	10.247
CDT-1223	18	1.649	10.565	8.916
CDT-1224	15	4.475	13.548	9.073
CDT-1226	21	4.479	27.494	23.015
CDT-1228	15	5.824	17.257	11.433
CDT-1230	24	22.179	16.693	-5.486
CDT-1231	15	7.375	5.214	-2.16
CDT-1232	33	12.562	55.547	42.985
CDT-1233	18	1.105	5.749	4.643
CDT-1234	30	11.754	56.002	44.248
CDT-1235	18	1.889	5.757	3.868
CDT-1236	30	29.058	41.08	12.022
CDT-1237	18	1.069	5.759	4.69
CDT-1238	18	3.629	8.773	5.144
CDT-1239	18	1.903	5.731	3.829
CDT-1240	24	5.07	23.651	18.581
CDT-1241	18	2.928	5.752	2.824
CDT-1242	30	12.541	15.148	2.607
CDT-1244	30	15.797	42.023	26.226
CDT-1245	18	2.979	9.076	6.097
CDT-1246	18	2.59	17.679	15.089
CDT-1247	15	1.707	6.941	5.234
CDT-1248	15	3.835	6.853	3.018
CDT-125	15	0	5.629	5.629
CDT-1250	24	9.009	19.699	10.69
CDT-1252	15	9.01	7.556	-1.454
CDT-1253	42	7.557	55.079	47.522
CDT-1254	30	21.057	36.951	15.894
CDT-1255	48	12.601	78.516	65.915

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-469	30	13.205	20.295	7.091
CDT-47	15	11.881	14.655	2.774
CDT-471	24	0.792	18.531	17.739
CDT-473	30	0.884	14.612	13.728
CDT-475	30	13.767	28.942	15.175
CDT-477	30	9.475	17.109	7.633
CDT-479	30	3.149	18.707	15.558
CDT-481	30	27.789	20.752	-7.037
CDT-483	36	22.541	36.296	13.755
CDT-485	30	13.761	29.29	15.529
CDT-487	30	13.311	16.043	2.732
CDT-489	36	14.324	39.603	25.279
CDT-491	30	0	45.253	45.253
CDT-493	36	24.89	19.647	-5.243
CDT-495	24	13.203	12.751	-0.452
CDT-497	30	13.31	24.87	11.56
CDT-499	15	0	8.692	8.692
CDT-501	30	6.537	28.682	22.145
CDT-503	30	11.034	16.667	5.633
CDT-505	36	14.328	29.103	14.775
CDT-507	30	0.659	16.736	16.078
CDT-509	30	11.626	16.12	4.494
CDT-51	15	1.674	3.86	2.186
CDT-511	30	9.962	21.757	11.795
CDT-513	30	24.359	48.569	24.21
CDT-515	30	3.253	19.247	15.993
CDT-517	30	18.795	27.748	8.953
CDT-519	30	0.238	22.824	22.586
CDT-521	30	0.95	13.725	12.775
CDT-523	30	10.318	22.043	11.725
CDT-525	30	0.469	17.256	16.788
CDT-529	30	24.38	31.313	6.933
CDT-53	15	9.132	2.565	-6.567
CDT-531	30	13.774	25	11.226
CDT-533	30	11.269	22.344	11.076
CDT-535	36	28.662	25.153	-3.509
CDT-537	30	13.77	16.36	2.591
CDT-539	30	5.762	65.026	59.265
CDT-541	18	0.035	8.652	8.617
CDT-543	30	13.309	22.842	9.533
CDT-545	36	28.582	25.034	-3.548
CDT-547	36	21.881	25.37	3.49
CDT-549	36	21.986	29.403	7.417
CDT-55	15	0	2.971	2.971

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-1256	15	12.089	10.433	-1.656
CDT-1257	48	12.591	78.726	66.135
CDT-1258	36	21.041	67.049	46.008
CDT-1259	48	12.564	78.684	66.12
CDT-1260	15	0	10.614	10.614
CDT-1261	48	12.537	78.526	65.989
CDT-1262	36	25.293	81.652	56.359
CDT-1263	48	15.536	215.447	199.911
CDT-1264	15	4.813	13.584	8.772
CDT-1265	36	40.972	33.6	-7.372
CDT-1266	36	45.165	63.13	17.964
CDT-1267	18	3.423	18.096	14.674
CDT-1268	36	41.372	63.623	22.251
CDT-1269	18	2.168	5.512	3.344
CDT-127	15	1.001	9.41	8.409
CDT-1270	15	1.673	1.573	-0.1
CDT-1271	18	1.887	7.688	5.801
CDT-1272	18	10.437	8.469	-1.968
CDT-1273	18	3.012	5.791	2.78
CDT-1274	15	6.299	3.701	-2.598
CDT-1275	24	18.512	21.358	2.845
CDT-1276	30	27.677	32.135	4.458
CDT-1277	18	4.192	6.41	2.218
CDT-1278	24	5.194	31.693	26.498
CDT-1279	24	4.161	21.216	17.054
CDT-1280	36	44.755	70.888	26.133
CDT-1282	36	4.378	62.765	58.388
CDT-1283	24	16.02	17.855	1.835
CDT-1286	24	7.429	14.32	6.892
CDT-1288	15	2.234	8.649	6.415
CDT-129	15	0	5.331	5.331
CDT-1290	15	4.041	3.345	-0.696
CDT-1291	18	7.935	17.188	9.253
CDT-1292	15	4.016	5.293	1.277
CDT-1294	21	4.437	10.446	6.009
CDT-1298	15	4.437	3.765	-0.671
CDT-1299	36	5.715	33.538	27.823
CDT-13	30	8.999	32.009	23.009
CDT-1300	15	4.436	8.523	4.087
CDT-1302	18	1.54	2.583	1.044
CDT-1303	18	3.325	7.618	4.293
CDT-1304	18	2.153	9.097	6.944
CDT-1306	30	24.459	51.047	26.588
CDT-1309	24	0	30.515	30.515

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-551	15	0	4.589	4.589
CDT-553	24	10.964	20.016	9.052
CDT-555	36	27.814	34.288	6.474
CDT-557	36	17.879	99.32	81.441
CDT-559	36	14.849	26.771	11.922
CDT-561	36	18.369	33.857	15.488
CDT-563	36	46.375	74.607	28.232
CDT-565	36	27.772	34.213	6.441
CDT-567	36	15.887	27.179	11.291
CDT-569	36	17.883	72.327	54.444
CDT-57	15	2.453	3.572	1.12
CDT-571	18	0	13.539	13.539
CDT-573	36	14.362	42.468	28.106
CDT-575	36	15.186	26.884	11.698
CDT-577	36	15.273	26.994	11.722
CDT-579	36	22.712	42.533	19.82
CDT-581	36	14.806	26.712	11.906
CDT-583	24	0.089	20.742	20.654
CDT-585	24	3.376	17.958	14.582
CDT-587	30	3.026	15.022	11.996
CDT-591	36	18.392	57.254	38.862
CDT-593	36	14.899	26.728	11.83
CDT-597	36	10.049	42.65	32.601
CDT-599	36	14.343	39.509	25.166
CDT-601	36	15.242	27.245	12.003
CDT-603	30	28.098	26.606	-1.492
CDT-605	36	38.138	53.963	15.825
CDT-607	36	29.921	53.77	23.849
CDT-609	36	23.207	42.911	19.704
CDT-61	15	0	6.114	6.114
CDT-611	42	22.185	36.482	14.297
CDT-613	36	40.548	77.973	37.424
CDT-615	36	39.592	47.18	7.588
CDT-617	36	15.506	26.606	11.1
CDT-619	36	15.487	26.713	11.226
CDT-621	42	71.513	113.391	41.879
CDT-623	42	11.358	58.443	47.085
CDT-625	42	91.247	75.261	-15.986
CDT-627	42	79.123	75.269	-3.854
CDT-629	42	70.48	75.261	4.781
CDT-63	15	6.533	3.768	-2.764
CDT-631	15	5.427	4.081	-1.346
CDT-633	60	0	261.504	261.504
CDT-635	36	32.908	72.811	39.903

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-131	15	0	7.146	7.146
CDT-1310	15	11.446	5.948	-5.498
CDT-1311	24	3.34	32.813	29.473
CDT-1312	18	2.669	10.339	7.671
CDT-1313	18	8.501	4.882	-3.619
CDT-1314	18	4.921	8.205	3.284
CDT-1315	42	30.828	28.217	-2.611
CDT-1316	24	6.315	17.405	11.09
CDT-1317	12	3.075	2.026	-1.049
CDT-1318	24	15.707	25.903	10.196
CDT-1319	15.996	6.066	16.329	10.263
CDT-1320	15	9.595	8.144	-1.451
CDT-1323	27	10.329	21.198	10.869
CDT-1324	18	6.82	6.15	-0.67
CDT-1325	24	10.323	19.267	8.945
CDT-1326	18	6.817	5.892	-0.925
CDT-1327	24	22.175	19.955	-2.221
CDT-1328	21	6.812	9.628	2.816
CDT-1329	24	9.635	31.939	22.304
CDT-133	15	0	1.942	1.942
CDT-1330	24	6.806	10.945	4.139
CDT-1331	18	0	7.883	7.883
CDT-1332	30	6.737	18.854	12.116
CDT-1333	15	0	11.325	11.325
CDT-1334	36	6.716	63.679	56.963
CDT-1336	30	1.009	21.252	20.243
CDT-1337	24	0.608	15.817	15.209
CDT-1339	30	15.207	49.166	33.959
CDT-1340	15	2.657	4.152	1.495
CDT-1342	15	7.581	4.491	-3.09
CDT-1343	18	14.335	13.154	-1.182
CDT-1344	21	7.315	9.56	2.244
CDT-1345	36	18.344	52.94	34.596
CDT-1346	15	8.341	6.545	-1.797
CDT-1348	18	4.4	15.836	11.437
CDT-1349	24	8.654	12.863	4.21
CDT-135	15	3.204	0.749	-2.456
CDT-1350	15	4.047	4.805	0.758
CDT-1351	15	0	10.484	10.484
CDT-1352	15	5.207	4.774	-0.434
CDT-1353	24	3.055	31.111	28.057
CDT-1354	15	2.84	5.572	2.732
CDT-1355	24	15.561	17.522	1.961
CDT-1356	36	24.417	26.639	2.222

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-637	48	114.647	101.388	-13.259
CDT-639	36	32.902	83.597	50.695
CDT-641	48	114.599	110.922	-3.677
CDT-643	48	106.846	107.439	0.593
CDT-645	42	82.174	75.753	-6.421
CDT-647	36	32.92	223.804	190.885
CDT-649	48	91.21	107.688	16.478
CDT-65	15	0.21	3.182	2.973
CDT-651	24	2.712	5.684	2.972
CDT-653	36	3.806	27.834	24.028
CDT-655	36	3.68	36.302	32.622
CDT-657	48	11.863	197.565	185.702
CDT-659	18	7.169	6.244	-0.925
CDT-661	18	12.132	5.074	-7.058
CDT-663	18	5.606	6.832	1.226
CDT-665	18	5.421	5.336	-0.085
CDT-667	18	12.156	5.171	-6.985
CDT-669	18	6.423	3.675	-2.748
CDT-67	15	0.77	2.237	1.467
CDT-671	48	34.755	135.551	100.796
CDT-673	36	28.938	25.069	-3.869
CDT-677	36	28.914	29.822	0.908
CDT-679	36	22.707	42.36	19.653
CDT-681	15	9.136	4.854	-4.282
CDT-683	15	0.906	4.381	3.475
CDT-685	21	3.664	22.478	18.813
CDT-687	36	14.776	37.888	23.112
CDT-689	24	6.985	20.276	13.291
CDT-691	36	3.469	38.044	34.575
CDT-693	42	11.724	67.697	55.973
CDT-697	42	7.575	36.523	28.948
CDT-699	36	15.089	27.553	12.464
CDT-701	36	14.941	27.914	12.973
CDT-703	15	2.713	3.082	0.369
CDT-705	36	15.749	26.743	10.994
CDT-707	36	15.634	26.128	10.494
CDT-71	18	0.114	17.239	17.125
CDT-713	15	9.618	8.77	-0.848
CDT-715	36	15.373	27.954	12.581
CDT-717	36	15.324	27.666	12.342
CDT-721	36	27.046	84.573	57.527
CDT-723	36	27.05	36.458	9.408
CDT-725	24	3.612	19.987	16.375
CDT-727	15	0	6.06	6.06

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-1357	24	15.44	15.895	0.455
CDT-1359	24	11.463	6.716	-4.747
CDT-1360	18	1.864	8.308	6.444
CDT-1361	30	21.385	19.916	-1.469
CDT-1362	15	4.306	11.658	7.352
CDT-1363	54	60.225	34.582	-25.643
CDT-1365	30	2.711	7.785	5.073
CDT-1366	18	1.903	4.938	3.036
CDT-1367	15	2.153	5.171	3.018
CDT-1368	18	1.899	7.175	5.276
CDT-1369	48	89.886	195.998	106.112
CDT-1373	15.996	1.811	6.901	5.091
CDT-1374	21	9.467	28.807	19.34
CDT-1375	24	11.079	18.423	7.345
CDT-1376	21	9.468	13.176	3.708
CDT-1377	36	5.742	23.776	18.033
CDT-1380	36	0	224.448	224.448
CDT-1381	30	5.751	20.874	15.123
CDT-1385	24	6.476	8.531	2.056
CDT-1389	30	6.468	26.626	20.158
CDT-139	15	0	4.782	4.782
CDT-1391	30	6.467	29.915	23.448
CDT-1393	30	6.465	48.113	41.648
CDT-1397	30	6.447	41.722	35.275
CDT-1399	18	0	17.494	17.494
CDT-1401	24	15.09	3.57	-11.521
CDT-1405	42	17.54	84.654	67.114
CDT-1407	42	17.484	84.52	67.035
CDT-141	15	6.902	5.419	-1.483
CDT-1419	24	0	98.625	98.625
CDT-1429	15	3.873	2.255	-1.618
CDT-143	15	2.515	5.387	2.871
CDT-1431	18	3.865	9.605	5.74
CDT-1433	21	3.778	7.916	4.138
CDT-1435	24	3.761	6.227	2.465
CDT-1437	27	5.308	23.097	17.79
CDT-1439	30	6.987	54.255	47.267
CDT-1445	18	5.235	10.763	5.527
CDT-145	15	4.123	7.139	3.016
CDT-1461	24	2.517	10.42	7.902
CDT-147	15	8.237	3.771	-4.466
CDT-1481	54	59.457	105.758	46.301
CDT-149	15	0	13.677	13.677
CDT-1491	30	2.187	180.39	178.203

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-729	15	9.125	9.871	0.746
CDT-731	18	5.926	13.666	7.74
CDT-733	15	0.991	6.988	5.997
CDT-735	15	8.237	6.239	-1.998
CDT-737	18	4.321	10.415	6.093
CDT-739	15	1.899	4.143	2.244
CDT-741	15	6.697	6.571	-0.126
CDT-743	18	11.202	5.956	-5.247
CDT-745	15	3.249	16.41	13.161
CDT-747	18	2.034	11.006	8.972
CDT-751	15	3.199	18.867	15.668
CDT-753	15	3.053	9.212	6.16
CDT-755	24	0	26.638	26.638
CDT-757	15	7.927	5.921	-2.006
CDT-759	18	1.011	12.355	11.345
CDT-763	36	31.556	119.988	88.433
CDT-765	27	12.116	15.268	3.152
CDT-769	30	35.103	42.904	7.801
CDT-77	18	4.447	3.954	-0.494
CDT-771	36	2.798	63.895	61.098
CDT-777	24	6.577	17.228	10.65
CDT-779	15	6.786	2.47	-4.316
CDT-781	36	16.695	29.349	12.654
CDT-783	24	1.524	13.259	11.735
CDT-785	24	8.927	17.817	8.89
CDT-79	15	0	5.887	5.887
CDT-791	30	24.357	94.484	70.128
CDT-795	48	114.52	211.405	96.885
CDT-799	30	34.95	55.891	20.94
CDT-801	15	6.524	5.851	-0.673
CDT-803	42	84.789	74.976	-9.813
CDT-805	15	4.354	6.364	2.01
CDT-807	18	13.287	12.323	-0.964
CDT-81	15	0	5.654	5.654
CDT-811	18	0	13.032	13.032
CDT-813	15	5.119	3.687	-1.432
CDT-815	42	10.811	35.048	24.236
CDT-817	42	16.205	33.11	16.905
CDT-819	48	28.206	41.292	13.086
CDT-821	48	34.792	75.318	40.527
CDT-823	15	8.419	3.638	-4.781
CDT-827	36	1.258	21.613	20.355
CDT-829	15	5.874	3.16	-2.714
CDT-83	15	1.71	3.861	2.151

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-15	24	0	30.349	30.349
CDT-1503	24	4.087	13.537	9.45
CDT-1505	24	4.215	23.314	19.099
CDT-1507	21	0	14.05	14.05
CDT-1509	21	0	15.115	15.115
CDT-151	15	0	0.765	0.765
CDT-1517	36	0	19.825	19.825
CDT-1521	18	4.095	10.656	6.561
CDT-1525	15	0	7.573	7.573
CDT-1529	30	6.481	30.113	23.632
CDT-153	15	0.434	4.093	3.659
CDT-1531	36	12.112	73.527	61.415
CDT-1545	36	0	64.807	64.807
CDT-1547	36	38.407	6.644	-31.763
CDT-1557	30	0.555	21.246	20.691
CDT-1559	15	4.434	8.033	3.599
CDT-157	15	8.077	2.241	-5.836
CDT-159	15	0	6.907	6.907
CDT-161	45	0	67.657	67.657
CDT-167	36	27.658	70.376	42.718
CDT-169	15	6.503	4.153	-2.349
CDT-17	24	6.311	11.294	4.983
CDT-173	18	4.325	5.32	0.995
CDT-177	15	5.401	6.863	1.462
CDT-179	18	0.469	4.457	3.988
CDT-181	18	0.386	3.947	3.56
CDT-183	18	0	2.936	2.936
CDT-185	18	10.338	12.734	2.396
CDT-187	30	1.895	30.765	28.87
CDT-19	18	2.245	10.318	8.073
CDT-191	18	6.813	8.821	2.009
CDT-193	15	3.252	5.746	2.495
CDT-195	18	2.906	4.882	1.976
CDT-197	18	1.773	6.63	4.857
CDT-199	18	0	5.858	5.858
CDT-201	18	0	4.071	4.071
CDT-203	18	1.237	8.347	7.11
CDT-207	18	6.815	5.444	-1.371
CDT-209	18	0	5.171	5.171
CDT-21	15	0	9.8	9.8
CDT-211	18	1.897	1.158	-0.739
CDT-215	18	0	8.371	8.371
CDT-217	18	9.824	4.222	-5.602
CDT-219	18	5.697	7.651	1.954

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-831	21	4.669	10.005	5.336
CDT-833	15	1.872	3.402	1.53
CDT-835	18	4.327	4.368	0.041
CDT-839	15	0	4.923	4.923
CDT-841	15	0	5.888	5.888
CDT-843	18	2.668	5.933	3.265
CDT-845	18	4.57	3.971	-0.599
CDT-849	36	9.112	27.087	17.975
CDT-85	15	1.914	2.26	0.346
CDT-853	24	9.751	8.744	-1.007
CDT-855	18	4.719	5.468	0.749
CDT-857	54	46.929	81.887	34.958
CDT-859	36	21.484	20.144	-1.34
CDT-861	24	9.492	9.445	-0.047
CDT-863	15	0	2.753	2.753
CDT-865	30	7.247	45.341	38.095
CDT-87	15	4.014	2.823	-1.191
CDT-873	15	0	2.273	2.273
CDT-875	15	0.218	3.176	2.958
CDT-877	24	6.355	6.688	0.334
CDT-879	24	6.495	8.012	1.517
CDT-881	24	6.718	7.019	0.302
CDT-883	30	6.906	16.654	9.747
CDT-885	30	7.148	15.625	8.477
CDT-887	18	6.492	8.1	1.608
CDT-889	15	0	4.448	4.448
CDT-89	15	0.384	3.157	2.773
CDT-891	18	0.011	1.705	1.694
CDT-895	30	21.391	40.823	19.432
CDT-897	30	21.385	25.709	4.324
CDT-899	15	0.311	2.708	2.397
CDT-901	24	0	20.39	20.39
CDT-903	24	26.062	21.242	-4.82
CDT-905	24	26.376	24.236	-2.14
CDT-909	24	23.422	18.654	-4.768
CDT-91	15	6.373	7.881	1.507
CDT-911	15	0	8.448	8.448
CDT-913	18	0	6.521	6.521
CDT-915	24	0	20.387	20.387
CDT-917	24	12.016	16.349	4.333
CDT-919	12	0	3.107	3.107
CDT-921	24	10.05	10.985	0.935
CDT-923	21	10.052	10.18	0.128
CDT-925	21	10.054	10.196	0.143

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-221	15	0	8.599	8.599
CDT-223	18	0	6.033	6.033
CDT-225	18	0	4.596	4.596
CDT-227	18	0.213	4.453	4.239
CDT-229	18	0	7.795	7.795
CDT-23	30	13.971	46.731	32.761
CDT-231	24	12.565	8.177	-4.388
CDT-233	18	0	2.556	2.556
CDT-235	21	0	9.246	9.246
CDT-237	18	4.425	3.721	-0.704
CDT-239	18	0.375	7.343	6.968
CDT-241	18	1.773	10.135	8.362
CDT-243	18	8.596	10.187	1.59
CDT-245	18	1.686	5.986	4.3
CDT-247	18	6.335	12.239	5.903
CDT-249	18	0	6.46	6.46
CDT-25	24	11.893	33.404	21.51
CDT-251	18	2.586	9.507	6.921
CDT-253	24	0.355	12.042	11.688
CDT-255	15	4.05	4.525	0.475
CDT-257	27	0	29.145	29.145
CDT-259	18	0	6.247	6.247
CDT-261	24	0	52.983	52.983
CDT-263	18	0.706	6.043	5.337
CDT-265	18	6.423	3.071	-3.352
CDT-269	36	0	27.445	27.445
CDT-273	8.004	0	1.011	1.011
CDT-275	18	0	5.666	5.666
CDT-277	18	4.029	15.964	11.934
CDT-279	18	1.897	11.576	9.679
CDT-281	18	0	3.635	3.635
CDT-285	18	6.411	2.581	-3.829
CDT-287	42	11.924	30.287	18.363
CDT-289	24	8.701	16.392	7.69
CDT-29	24	4.789	28.012	23.223

ID	Pipe Size (in)	Existing Flow (cfs)	Pipe Capacity (cfs)	Excess Capacity (cfs)
CDT-927	21	5.693	3.016	-2.677
CDT-929	15	7.786	5.489	-2.297
CDT-93	15	3.493	2.629	-0.864
CDT-931	15	7.463	5.513	-1.95
CDT-935	24	9.968	36.292	26.324
CDT-937	24	9.96	10.479	0.519
CDT-939	15	3.185	3.872	0.688
CDT-941	18	3.17	8.445	5.275
CDT-943	30	28.276	31.863	3.587
CDT-945	30	28.863	20.921	-7.942
CDT-949	18	6.814	8.539	1.724
CDT-95	15	0	3.866	3.866
CDT-951	18	6.752	8.553	1.8
CDT-953	24	9.093	21.397	12.303
CDT-957	30	7.522	32.497	24.974
CDT-959	36	32.906	62.346	29.439
CDT-961	18	0	9.42	9.42
CDT-963	15	0	5.547	5.547
CDT-97	15	0	2.277	2.277
CDT-971	24	21.225	16.656	-4.569
CDT-973	30	0	39.564	39.564
CDT-975	24	10.332	19.411	9.079
CDT-977	30	10.313	50.312	39.999
CDT-979	18	10.339	8.789	-1.55
CDT-981	15	8.502	4.703	-3.799
CDT-983	18	0	4.139	4.139
CDT-985	15	0	4.776	4.776
CDT-987	15	0	6.545	6.545
CDT-989	18	0	6.537	6.537
CDT-99	15	7.48	3.01	-4.47
CDT-991	15	0	3.942	3.942
CDT-993	18	0	7.681	7.681
CDT-995	18	1.536	6.918	5.382
CDT-997	18	0	8.117	8.117
CDT-999	30	19.66	34.57	14.91

224.448

261.504